

# Tanzu Application Service for VMs v6.0

Tanzu Platform for Cloud Foundry 6.0

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# TAS for VMs overview

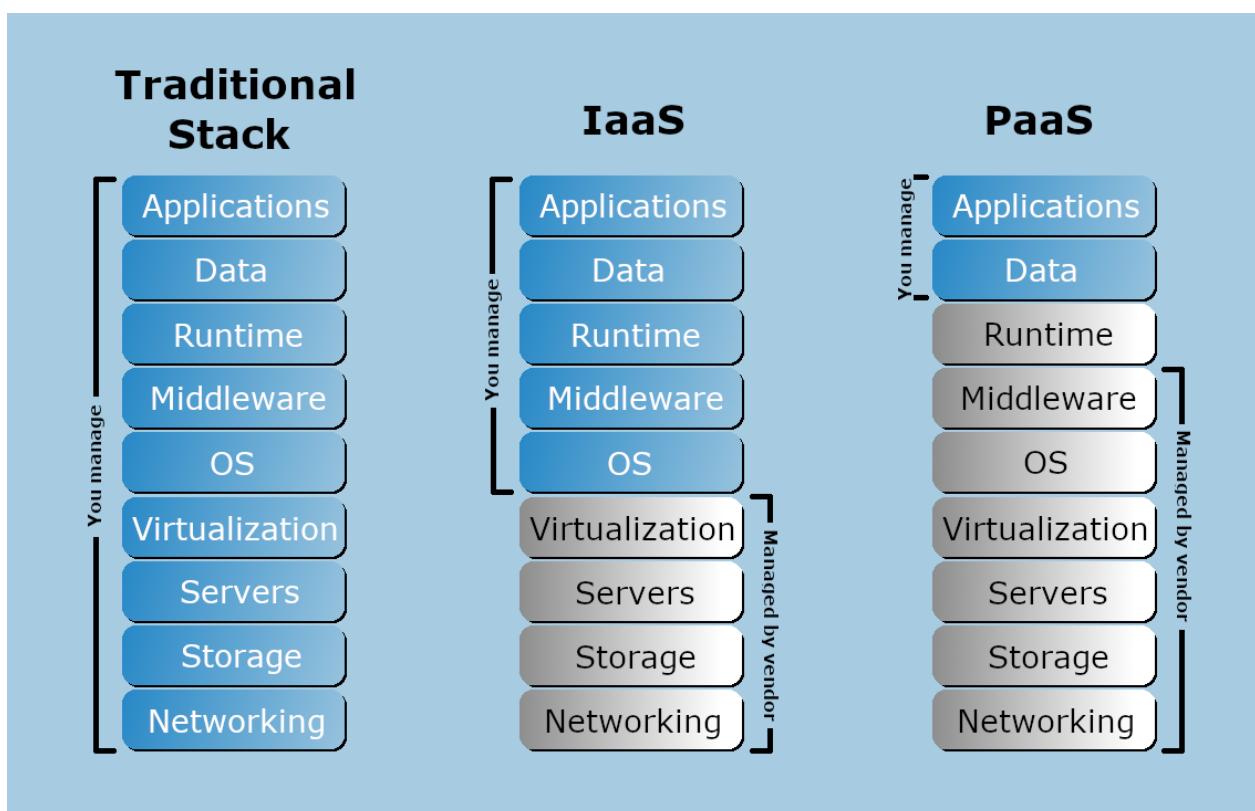
This topic tells you about VMware Tanzu Application Service for VMs (TAS for VMs) and how it works with Tanzu Operations Manager.

## Introduction to Cloud Platforms

Cloud platforms enable rapid deployment of applications and services, making them globally accessible within minutes. When application requests increase, cloud infrastructure can automatically scale to meet higher demand, eliminating traditional build-outs and migrations. This approach allows developers to focus on applications and data without the need to manage underlying infrastructure.

The following diagram illustrates the layers of a typical technology stack, comparing the traditional IT model with an IaaS stack and a PaaS stack, showing which layers are managed by users vs. providers.

- **Traditional IT Stack:** All layers are managed in-house, including applications, data, runtime, middleware, OS, virtualization, servers, storage, and networking.
- **IaaS Stack:** The provider manages the servers, storage, networking, and virtualization, while the user manages applications, data, runtime, middleware, and OS.
- **PaaS Stack:** The provider manages all layers except for applications and data, which remain the user's responsibility.



[View a larger version of this diagram.](#)

## About TAS for VMs

This section describes why TAS for VMs is an industry-standard cloud platform.

Not all cloud platforms are created equal. Some have limited language and framework support, lack key app services, or restrict deployment to a single cloud.

As an industry-standard cloud platform, TAS for VMs offers the following:

- **Open source code:** The platform's openness and extensibility prevent its users from being locked into a single framework, set of app services, or cloud. For more information, see the [Cloud Foundry](#) project on GitHub.
- **Deployment automation:** Developers can deploy their apps to TAS for VMs using their existing tools and with zero modification to their code.
- **Flexible infrastructure:** You can deploy TAS for VMs to run your apps on your own computing infrastructure, or deploy on an IaaS like vSphere, AWS, Azure, GCP, or OpenStack.
- **Commercial options:** You can also use a PaaS deployed by a commercial TAS for VMs cloud provider. For more information, see [Cloud Foundry Certified Platforms](#).
- **Community support:** A broad community contributes to and supports TAS for VMs. See [Welcome to the Cloud Foundry Community](#).

TAS for VMs is ideal for anyone interested in removing the cost and complexity of configuring infrastructure for their apps.

## How TAS for VMs Works

To flexibly serve and scale apps online, TAS for VMs has subsystems that perform specialized functions. The following sections describe how some of these main subsystems work.

### Load balancing

This section describes how TAS for VMs handles load balancing.

Clouds balance their processing loads over multiple machines, optimizing for efficiency and resilience against point failure. A TAS for VMs installation accomplishes this using the following components:

- **BOSH** creates and deploys VMs on top of a physical computing infrastructure, and deploys and runs TAS for VMs on top of this cloud. To configure the deployment, BOSH follows a manifest document. For more information, see the [BOSH documentation](#).
- **Cloud Controller** runs the apps and other processes on the cloud's VMs, balancing demand and managing app lifecycles. For more information, see [Cloud Controller](#).
- The **Gorouter** routes incoming traffic from the world to the VMs that are running the apps that the traffic demands, usually working with a customer-provided load balancer. For more information, see [TAS for VMs Routing Architecture](#).

### Running apps

This section describes the VMs that run your apps in TAS for VMs and how the platform packages your apps to run on these VMs.

## VMs in TAS for VMs

TAS for VMs designates the following types of VMs:

- **Component VMs** make up the platform's infrastructure.
- **Host VMs** host your apps for the outside world.

Within TAS for VMs, the Diego system distributes the hosted app load over all of the host VMs, and keeps it running and balanced through demand surges, outages, or other changes. Diego accomplishes this through an auction algorithm.

For more information, see [Diego Components and Architecture](#).

## Distributing apps

To meet demand, multiple host VMs run duplicate instances of the same app. This means that apps must be portable. TAS for VMs distributes app source code to VMs with everything the VMs need to compile and run the apps locally.

TAS for VMs includes the following with your app's source code:

- **Stack**: the operating system the app runs on.
- **Buildpack**: contains all languages, libraries, and services that the app uses.

Before sending an app to a VM, the Cloud Controller stages it for delivery by combining the stack, buildpack, and source code into a droplet that the VM can unpack, compile, and run. For simple, standalone apps with no dynamic pointers, the droplet can contain a pre-compiled executable instead of source code, language, and libraries.

For more information, see:

- [Changing Stacks](#)
- [Buildpacks](#)
- [How Apps Are Staged](#)

## Organizing users and workspaces

This section describes how TAS for VMs organizes users and workspaces.

TAS for VMs manages user accounts through two User Account and Authentication (UAA) servers, which support access control as OAuth2 services and can store user information internally, or connect to external user stores through LDAP or SAML.

For more information, see [User Account and Authentication \(UAA\) Server](#).

The following table describes what the two UAA servers do:

Server	Purpose
First UAA server	<ul style="list-style-type: none"> <li>Grants access to BOSH</li> <li>Holds accounts for Tanzu Operations Manager operators who deploy runtimes, services, and other software onto the BOSH layer directly</li> </ul>
Second UAA server	<ul style="list-style-type: none"> <li>Controls access to the Cloud Controller</li> <li>Defines user roles, such as admin, developer, or auditor, and grants them different sets of privileges to run TAS for VMs commands</li> <li>Scopes the roles to separate, compartmentalized orgs and spaces within an installation to manage and track use</li> </ul>

For more information, see [Orgs, Spaces, Roles, and Permissions](#).

## Storing resources

The following table describes where TAS for VMs stores resources:

Resource	Storage Location
<ul style="list-style-type: none"> <li>Source code</li> <li>Buildpacks</li> <li>Documentation</li> <li>Custom configurations</li> <li>Other platform resources</li> </ul>	GitHub
<ul style="list-style-type: none"> <li>Large binary files</li> <li>Droplets</li> </ul>	Internal or external blobstore
<ul style="list-style-type: none"> <li>Internal component states</li> <li>Other temporary information</li> </ul>	MySQL

## Communicating with components

This section describes how TAS for VMs components communicate with one another.

TAS for VMs components communicate in the following ways:

- By sending messages internally using HTTP and HTTPS protocols
- By sending NATS messages to each other directly

BOSH Director co-locates a BOSH DNS server on every deployed VM. All VMs keep up-to-date DNS records for all the other VMs in the same foundation. This enables service discovery between VMs.

BOSH DNS allows deployments to continue communicating with VMs even when the VMs' IP addresses change. It also provides client-side load balancing by randomly selecting a healthy VM when multiple VMs are available.

For more information about BOSH DNS, see [Native DNS Support](#) in the BOSH documentation.

## Monitoring and Analyzing

This section describes logging in TAS for VMs.

TAS for VMs generates system logs from TAS for VMs components and app logs from hosted apps. As TAS for VMs runs, its component and host VMs generate logs and metrics. TAS for VMs apps also typically generate logs.

The following table describes where TAS for VMs sends logs:

Log Type	Destination
TAS for VMs component logs	Rsyslog agents
TAS for VMs component metrics	Loggregator
App logs	Loggregator

Component logs stream from rsyslog agents, and the cloud operator can configure them to stream out to a syslog drain.

The Loggregator system aggregates the component metrics and app logs into a structured, usable form, the Firehose. You can use all of the output of the Firehose, or direct the output to specific uses, such as monitoring system internals, triggering alerts, or analyzing user behavior, by applying nozzles.

For more information, see [Loggregator Architecture](#).

## Using services

This section describes how you can use services with your apps on TAS for VMs.

Typical apps depend on free or metered services such as databases or third-party APIs. To incorporate these into an app:

1. **Write a Service Broker:** This component manages the life cycle of the service. The Service Broker uses the Service Broker API to advertise a catalog of service offerings to TAS for VMs apps.
2. **Provision the Service Instance:** Create an instance of the service offering by sending a provision request to the Service Broker API.
3. **Enable apps to access the Service Instance:** Configure the TAS for VMs app to make calls to the Service Instance using the Service Broker API.

For more information, see [Services](#).

## Small Footprint TAS for VMs

The Small Footprint TAS for VMs is a repackaging of the TAS for VMs components into a smaller deployment with fewer virtual machines (VMs). For a description of the limitations that come with a smaller deployment, see [Limitations](#).

## Differentiate small footprint TAS for VMs and TAS for VMs

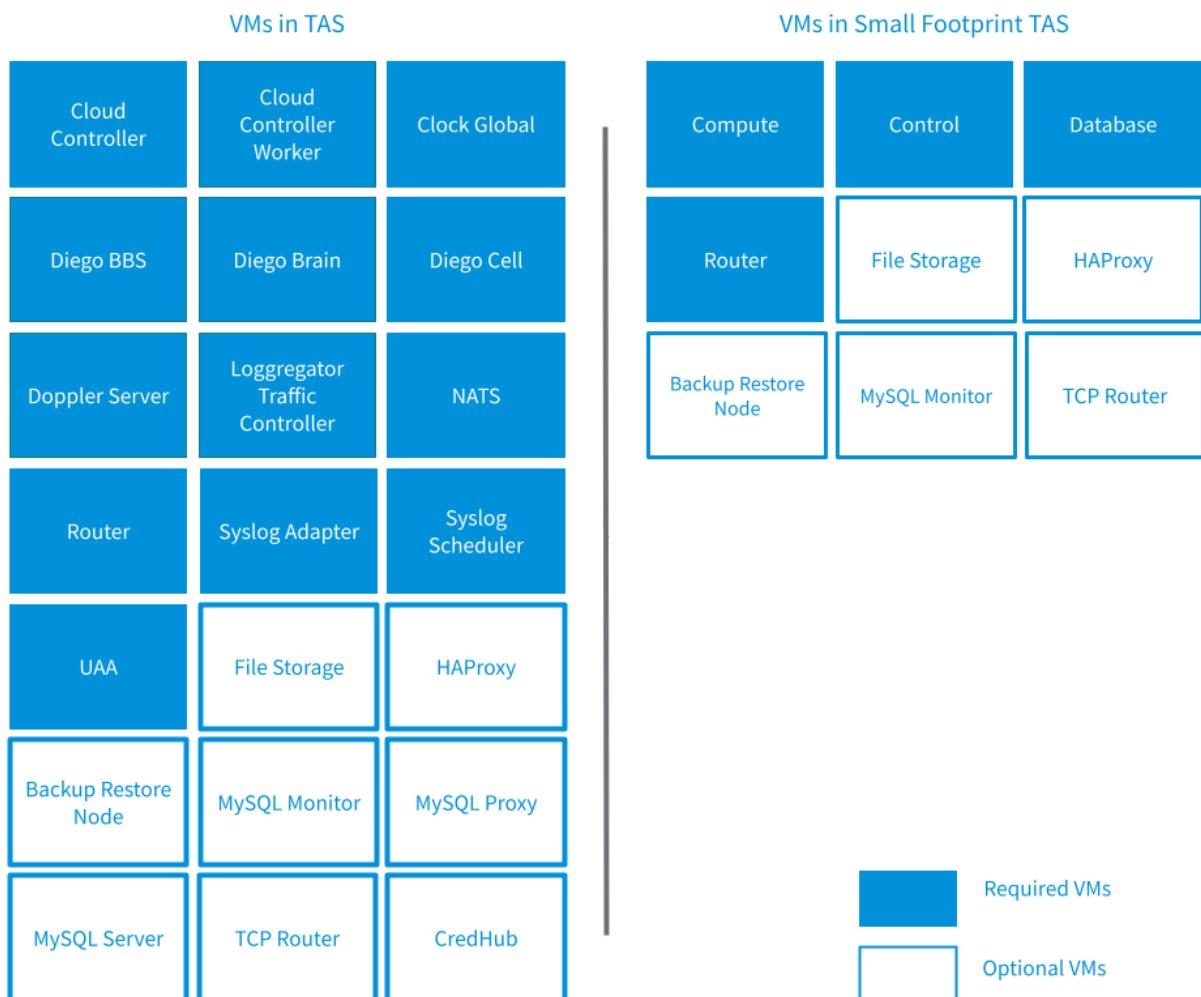
A standard TAS for VMs deployment must have at least 13 VMs, but Small Footprint TAS for VMs requires only four.

- Required VMs: Cloud Controller, Cloud Controller Worker, Clock Global, Diego BBS, Diego Brain, Diego Cell, Doppler Server, Loggregator Traffic Controller, NATS, Router, Syslog Adapter, Syslog Scheduler, and UAA.
- Optional VMs: File Storage, HAProxy, Backup Restore Node, MySQL Monitor, MySQL Proxy, MySQL Server, TCP Router, and CredHub.

For Small Footprint TAS for VMs:

- Required VMs: Compute, Control, Database, and Router.
- Optional VMs: File Storage, HAProxy, Backup Restore Node, MySQL Monitor, and TCP Router.

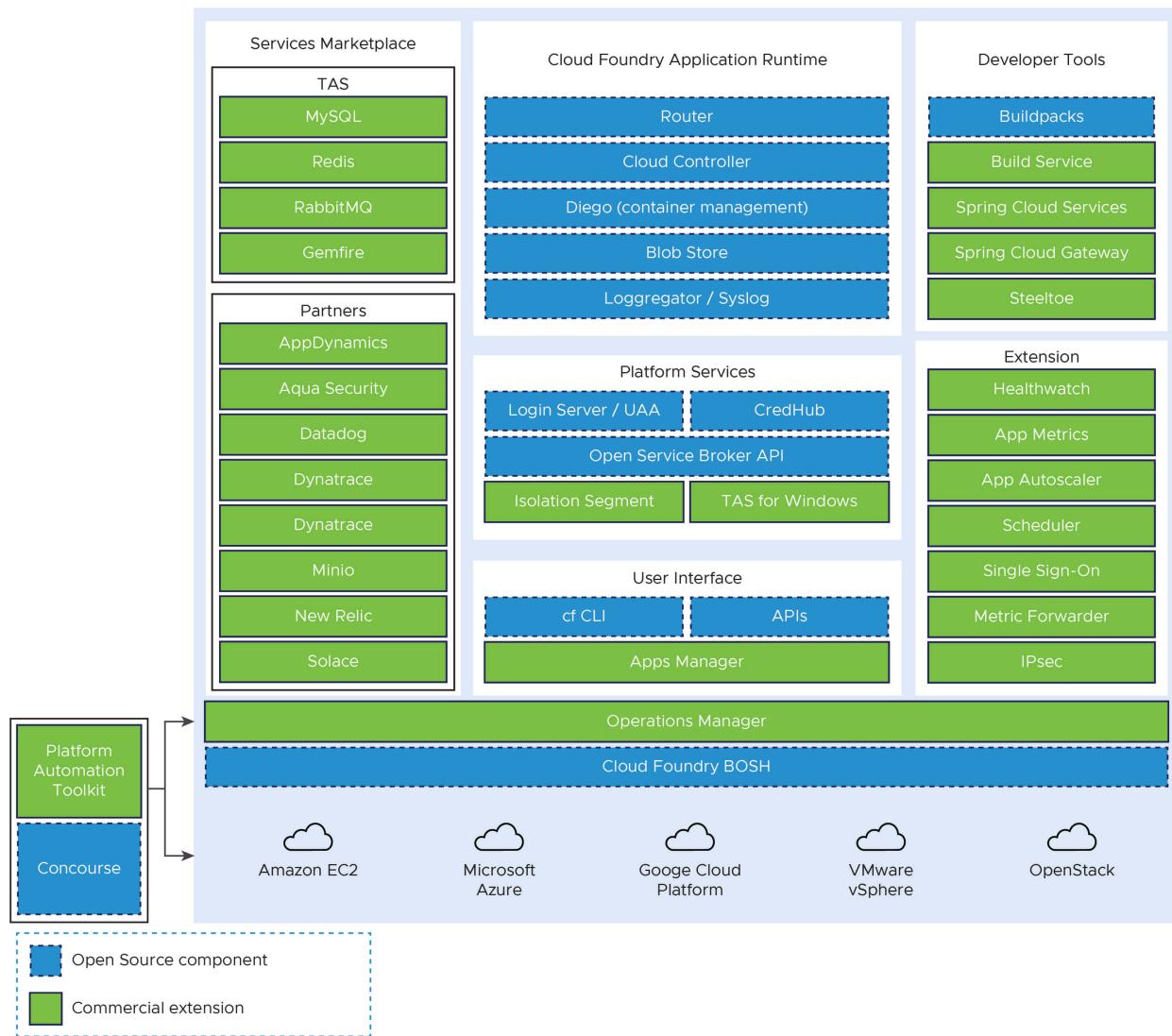
The following image displays a comparison of the number of VMs deployed by TAS for VMs and Small Footprint TAS for VMs.



## How TAS for VMs Differs from Open Source Cloud Foundry

Open-source software provides the basis for TAS for VMs, which is the VMware distribution of [Cloud Foundry Application Runtime](#) software for hosting apps. VMware offers additional commercial features, enterprise services, support, documentation, certificates, and other value-adds.

The following diagram shows open source Cloud Foundry components in blue and commercial features available with TAS for VMs in green:



[View a larger version of this diagram.](#)

# Release Notes

In this section:

- [TAS for VMs v6.0 Breaking Changes](#)
- [VMware Tanzu Application Service for VMs Release Notes](#)
  - [v6.0.18](#)
  - [v6.0.17](#)
  - [v6.0.16](#)
  - [v6.0.15](#)
  - [v6.0.14](#)
  - [v6.0.13](#)
  - [v6.0.12](#)
  - [v6.0.11](#)
  - [v6.0.10](#)
  - [v6.0.9](#)
  - [v6.0.8](#)
  - [v6.0.7](#)
  - [v6.0.6](#)
  - [v6.0.5](#)
  - [v6.0.4](#)
  - [v6.0.3](#)
  - [v6.0.2](#)
  - [v6.0.1](#)
  - [v6.0.0](#)
- [VMware Tanzu Application Service for VMs \[Windows\] Release Notes](#)
  - [v6.0.18](#)
  - [v6.0.17](#)
  - [v6.0.16](#)
  - [v6.0.15](#)
  - [v6.0.14](#)

- v6.0.13
  - v6.0.12
  - v6.0.11
  - v6.0.10
  - v6.0.9
  - v6.0.8
  - v6.0.7
  - v6.0.6
  - v6.0.5
  - v6.0.4
  - v6.0.3
  - v6.0.2
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- Isolation Segment Release Notes
    - v6.0.18
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    - v6.0.7
    - v6.0.6
    - v6.0.5
    - v6.0.4
    - v6.0.3
    - v6.0.2
    - v6.0.1
    - v6.0.0

# TAS for VMs v6.0 Release notes

These are the release notes for VMware Tanzu Application Service for VMs (TAS for VMs) v6.0.



**Known Issue:** cf-networking-release versions 3.67.0 - 3.70.0 contain a bug that breaks pagination for listing and removing container-to-container (c2c) network policies when the user has more than 100 roles, as is often the case for users involved in automated provisioning. This bug only affects listing and removing network policies and not enforcing those policies. This bug also does not affect Application Security Groups. For more information, see this [Knowledge Base article](#).

**Affected versions:** 6.0.14, 6.0.15, 6.0.16, 6.0.17



Addresses Policy Server database migration failures and crashes seen when upgrading to version 4.0.35, 6.0.15, and 10.0.5.

This reverts the previous feature improvement - "Multiple enhancements to Application Security Group data syncing when using Dynamic ASGs at very high scale" which was added in 4.0.35, 6.0.15, and 10.0.5.

TAS for VMs is certified by the Cloud Foundry Foundation for 2024.

For more information about the Cloud Foundry Certified Provider Program, see [How Do I Become a Certified Provider?](#) on the Cloud Foundry website.

Because VMware uses the Percona Distribution for MySQL, expect a time lag between Oracle releasing a MySQL patch and VMware releasing TAS for VMs containing that patch.

**Deprecation Notice:** Cloud Foundry Command-Line Interface (cf CLI) v7 is deprecated and will lose support. For how to upgrade to cf CLI v8 see [Upgrading to cf CLI v8](#).



**Important cross-version issues:**

- **v6.0.7 - v6.0.11** versions contain a bug that causes intermittent TCP connectivity issues between TAS for VMs and tiles that use `routing` release 0.301.0 or earlier, such as Tanzu for MySQL on Cloud Foundry v3.3.0 and earlier, and Redis for Tanzu Application Service v3.5.0 and earlier. For details, see [TCP Routes from Tiles are Pruned Intermittently Resulting in connectivity issues](#)
- **v6.0.0 - v6.0.3** versions contain an RFC protocol issue with Gorouter, CVE-2024-22279, that can lead to denial of service. The issue has been fixed. For details, see [TNZ-2024-0100](#).

## Releases

### 6.0.18

**Release Date:** 07/22/2025

- **[Feature]** Add new component “NATS Monitor” to detect and fix NATS server split brains. See the “Networking” tab to configure this new component.
- **[Feature]** Allow automatic creation of UAA Shadow users
- **[Feature Improvement]** Restrict binary log footprint to 24h for internal PXC database
- **[Bug Fix]** Fixes a bug where users were unable to list network policies when they had more than 100 non-admin space roles assigned
- Bump binary-offline-buildpack to version [1.1.52](#)
- Bump capi to version [1.212.0](#)
- Bump cf-autoscaling to version [250.5.5](#)
- Bump cf-networking to version [3.72.0](#)
- Bump cflinuxfs3 to version [0.642.0](#)
- Bump cflinuxfs4 to version [1.317.0](#)
- Bump credhub to version [2.14.6](#)
- Bump diego to version [2.118.0](#)
- Bump dotnet-core-offline-buildpack to version [2.4.73](#)
- Bump garden-runc to version [1.73.0](#)
- Bump go-offline-buildpack to version [1.10.71](#)
- Bump java-offline-buildpack to version [4.85.0](#)
- Bump mysql-monitoring to version [10.26.0](#)
- Bump nats to version [56.52.0](#)
- Bump nats-monitor to version [0.0.9](#)
- Bump nfs-volume to version [7.32.0](#)
- Bump nginx-offline-buildpack to version [1.2.61](#)
- Bump nodejs-offline-buildpack to version [1.8.72](#)
- Bump notifications to version [81.0.3](#)
- Bump notifications-ui to version [57.0.1](#)
- Bump php-offline-buildpack to version [4.6.60](#)
- Bump push-apps-manager-release to version [677.0.80](#)
- Bump push-usage-service-release to version [674.0.177](#)
- Bump pxc to version [1.1.1](#)
- Bump python-offline-buildpack to version [1.8.68](#)
- Bump r-offline-buildpack to version [1.2.55](#)
- Bump routing to version [0.342.0](#)

- Bump ruby-offline-buildpack to version [1.10.53](#)
- Bump silk to version [3.72.0](#)
- Bump smb-volume to version [3.30.0](#)
- Bump staticfile-offline-buildpack to version [1.8.49](#)
- Bump uaa to version [77.20.7](#)

## Security Fixes

Component	Vulnerabilities Resolved
capi	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-g85v-wf27-67xc</a> (high)</li> <li>• <a href="#">GHSA-gjh7-p2fx-99vx</a> (high)</li> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">GHSA-mxr3-8whj-j74r</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> <li>• <a href="#">GHSA-vpfw-47h7-xj4g</a> (medium)</li> </ul>
cf-autoscaling	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-h3gc-qfqq-6h8f</a> (high)</li> <li>• <a href="#">GHSA-6r3c-xf4w-jxjm</a> (medium)</li> <li>• <a href="#">GHSA-vrw8-fxc6-2r93</a> (medium)</li> <li>• <a href="#">GHSA-wc4r-xq3c-5cf3</a> (medium)</li> <li>• <a href="#">CVE-2025-49014</a> (medium)</li> </ul>
credhub	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-hq9p-pm7w-8p54</a> (high)</li> <li>• <a href="#">GHSA-h3gc-qfqq-6h8f</a> (high)</li> <li>• <a href="#">GHSA-6r3c-xf4w-jxjm</a> (medium)</li> <li>• <a href="#">GHSA-wc4r-xq3c-5cf3</a> (medium)</li> </ul>
diego	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">GHSA-mh63-6h87-95cp</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
dotnet-core-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>

Component	Vulnerabilities Resolved
garden-runc	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-cm76-qm8v-3j95</a> (high)</li> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
go-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
java-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-vv7r-c36w-3prj</a> (high)</li> <li>• <a href="#">GHSA-4jrv-ppp4-jm57</a> (high)</li> <li>• <a href="#">GHSA-fg7x-g82r-94qc</a> (high)</li> <li>• <a href="#">GHSA-hv5j-3h9f-99c2</a> (high)</li> <li>• <a href="#">CVE-2024-27282</a> (medium)</li> <li>• <a href="#">GHSA-7fc5-f82f-cx69</a> (medium)</li> <li>• <a href="#">GHSA-4h8f-2wvx-gg5w</a> (medium)</li> <li>• <a href="#">GHSA-v435-xc8x-wvr9</a> (medium)</li> <li>• <a href="#">GHSA-gh9q-2xrm-x6qv</a> (medium)</li> <li>• <a href="#">GHSA-7g45-4rm6-3mm3</a> (medium)</li> <li>• <a href="#">GHSA-m5vv-6r4h-3vj9</a> (medium)</li> <li>• <a href="#">GHSA-8xfc-gm6g-vgpv</a> (medium)</li> <li>• <a href="#">GHSA-m44j-cfrm-g8qc</a> (medium)</li> <li>• <a href="#">GHSA-hww2-5g85-429m</a> (medium)</li> <li>• <a href="#">GHSA-p53j-g8pw-4w5f</a> (medium)</li> <li>• <a href="#">GHSA-mhwm-jh88-3gjf</a> (medium)</li> <li>• <a href="#">GHSA-5mg8-w23w-74h3</a> (low)</li> <li>• <a href="#">GHSA-22h5-pq3x-2gf2</a> (low)</li> </ul>
mysql-monitoring	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
nats	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>

Component	Vulnerabilities Resolved
nfs-volume	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-4575</a> (medium)</li> <li>• <a href="#">GHSA-vrw8-fxc6-2r93</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
nodejs-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-4517</a> (critical)</li> <li>• <a href="#">CVE-2025-4435</a> (high)</li> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4138</a> (high)</li> <li>• <a href="#">CVE-2025-4330</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-4516</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> <li>• <a href="#">CVE-2024-12718</a> (medium)</li> </ul>
notifications	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
notifications-ui	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
push-apps-manager-release	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-xffm-g5w8-qvg7</a> (high)</li> <li>• <a href="#">GHSA-6v2p-p543-phr9</a> (high)</li> </ul>
pxc	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
r-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
routing	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> <li>• <a href="#">GHSA-6v2p-p543-phr9</a> (high)</li> <li>• <a href="#">CVE-2025-49014</a> (medium)</li> </ul>

Component	Vulnerabilities Resolved
smb-volume	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">GHSA-vrw8-fxc6-2r93</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
staticfile-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
uaa	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-hq9p-pm7w-8p54</a> (high)</li> <li>• <a href="#">GHSA-25xr-qj8w-c4vf</a> (high)</li> <li>• <a href="#">GHSA-h3gc-qfqq-6h8f</a> (high)</li> <li>• <a href="#">GHSA-4j3c-42xv-3f84</a> (high)</li> <li>• <a href="#">GHSA-wc4r-xq3c-5cf3</a> (medium)</li> <li>• <a href="#">GHSA-h2fw-rfh5-95r3</a> (low)</li> </ul>

## Components

These are the latest component versions for TAS for VMs.

Component	Version
stemcell os: ubuntu-jammy	1.844
backup-and-restore-sdk	1.19.45
binary-offline-buildpack	1.1.52
bosh-dns-aliases	0.0.4
bpm	1.4.20
capi	1.212.0
cf-autoscaling	250.5.5
cf-cli	2.3.0
cf-networking	3.72.0
cflinuxfs3	0.642.0
cflinuxfs4	1.317.0
count-cores-indicator	2.0.0
credhub	2.14.6
diego	2.118.0
dotnet-core-offline-buildpack	2.4.73

Component	Version
garden-runc	1.73.0
go-offline-buildpack	1.10.71
java-offline-buildpack	4.85.0
java-native-image-cnb-buildpack	0.11.22
log-cache	3.2.0
loggregator	107.0.21
loggregator-agent	8.3.8
metric-registrar	4.0.8
mysql-monitoring	10.26.0
nats	56.52.0
nats-monitor	0.0.9
nfs-volume	7.32.0
nginx-offline-buildpack	1.2.61
nodejs-offline-buildpack	1.8.72
notifications	81.0.3
notifications-ui	57.0.1
otel-collector	0.11.4
php-offline-buildpack	4.6.60
push-apps-manager-release	677.0.80
push-offline-docs-release	6.0.176
push-usage-service-release	674.0.177
pxc	1.1.1
python-offline-buildpack	1.8.68
r-offline-buildpack	1.2.55
routing	0.342.0
ruby-offline-buildpack	1.10.53
web-servers-cnb-buildpack	0.15.2
silk	3.72.0
smb-volume	3.30.0
smoke-tests	4.10.0
staticfile-offline-buildpack	1.8.49

Component	Version
statsd-injector	1.11.48
syslog	12.3.9
system-metrics-scraper	4.0.18
uaa	77.20.7
tanzu-jammy-stack	1.0.1

Component	Version	Release Notes
ubuntu-jammy stemcell	1.844	
backup-and-restore-sdk	1.19.45	

Component	Version	Release Notes
binary-offline-buildpack	1.1.52	<p>▼ v1.1.52</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 9.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 9.zip - binary_buildpack-cached-windows-v1.1.29.z ip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.51</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 8.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 8.zip - binary_buildpack-cached-windows-v1.1.28.z ip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.50</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 8.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 8.zip - binary_buildpack-cached-windows-v1.1.28.z ip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
bosh-dns-aliases	0.0.4	
bpm	1.4.20	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
capi	1.212.0	
cf-autoscaling	250.5.5	<p>▼ v250.5.5</p> <pre> ## What's Changed Bosh Release: * Added internal configuration option for BR metadata * Primarily used to control the name of uaa release Notable Dependency Bumps: * CF API v2 endpoints -&gt; v3 * Underlying code change but behavior remains the same * Golang 1.24.3 -&gt; 1.24.4 * Also bump go.mod min version to 1.24.4 * Spring Boot 3.5.0 -&gt; 3.5.3 * jq 1.8.0 -&gt; 1.8.1 See full changelist for specific bumps in `build.gradle` and `go.mod`</pre>
cf-cli	2.3.0	

Component	Version	Release Notes
cf-networking	3.72.0	<p>▼ v3.72.0</p> <pre>## 3.72.0 **Release Date**: June 16, 2025 ## Changes - Dependency Bumps ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.71.0...v3.72.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.71.0...v3.72.0</a> ## Resources - [Download release 3.72.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.72.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.72.0</a>).</pre> <p>▼ v3.71.0</p> <pre>## 3.71.0 **Release Date**: June 11, 2025 ## Changes - Fixes a bug where policy-server's network-policy list API would break when a user had more than 100 roles in CF. This affected both the `cf network-policies` and `cf remove-network-policy` commands. Thanks @mariash! - Modifies policy-server DB migrations to happen inside the `policy-server` main command, instead of as a pre-start, to remove our reliance on a custom fork of the migration library. Thanks @kart2bc ! - Refactored cni-loader to work with non-deprecated config loading functions. Thanks @kart2bc ! - Bumped to golang 1.24.4 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.70.0...v3.71.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.70.0...v3.71.0</a> ## Resources - [Download release 3.71.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.71.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.71.0</a>).</pre>
cflinuxfs3	0.642.0	
cflinuxfs4	1.317.0	
count-cores-indicator	2.0.0	

Component	Version	Release Notes
credhub	2.14.6	<p>▼ 2.14.6</p> <pre>## What's Changed * feat: make BBR metadata configurable by @peterhaochen47 in https://github.com/pivotal/credhub-release/pull/347 * various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.14.5...2.14.6">https://github.com/pivotal/credhub-release/compare/2.14.5...2.14.6</a></pre>
		<p>▼ 2.14.5</p> <pre>## What's Changed * various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.14.4...2.14.5">https://github.com/pivotal/credhub-release/compare/2.14.4...2.14.5</a></pre>
		<p>▼ 2.14.4</p> <pre>## What's Changed * Build(deps): Bump rubocop from 1.76.1 to 1.76.2 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/343 * various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.14.3...2.14.4">https://github.com/pivotal/credhub-release/compare/2.14.3...2.14.4</a></pre>
		<p>▼ 2.14.3</p> <pre>## What's Changed * various dependency bumps * replaced more deprecated Java API calls **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.14.2...2.14.3">https://github.com/pivotal/credhub-release/compare/2.14.2...2.14.3</a></pre>

Component	Version	Release Notes
diego	2.118.0	<p>▼ v2.118.0</p> <pre> ## 2.118.0 **Release Date**: June 12, 2025 ## Changes - Bumped to golang 1.24.4 - Bumped to jq 1.8 - Go Dependency bumps - Δ Removes the ability to configure logging.format.timestamp. All logging timestamps are now in rfc3339 format for readability. Thanks @kart2bc! - Adds the ability to specify a default timeout when using declarative healthchecks in the event an app does not specify one.  ## Bosh Job Spec changes: ```diff diff --git a/jobs/auctioneer/spec b/jobs/auctioneer/spec index 1fac48936..e7445644b 100644 --- a/jobs/auctioneer/spec +++ b/jobs/auctioneer/spec @@ -99,10 +99,6 @@ properties: description: When set, the auctioneer attempts to claim a lock from the Locket API. default: true - logging.format.timestamp: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "unix-epoch" - loggregator.use_v2_api: description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." default: false diff --git a/jobs/bbs/spec b/jobs/bbs/spec index 49ad1d095..e80fffc064 100644 --- a/jobs/bbs/spec +++ b/jobs/bbs/spec @@ -163,10 +163,6 @@ properties: description: Maximum number of files (including sockets) the BBS process may have open. default: 100000 - logging.format.timestamp: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which logged strings will be truncated. If set to 0, turns off truncation." default: 640 diff --git a/jobs/file_server/spec b/jobs/file_server/spec </pre>

Component	Version	Release Notes
		<pre> index f530805b3..460201389 100644 --- a/jobs/file_server/spec +++ b/jobs/file_server/spec @@ -60,10 +60,6 @@ properties: tls.key: description: "PEM-encoded tls key" - logging.format.timestamp: - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." - default: "unix-epoch" - loggregator.use_v2_api: description: "Whether component should use the v2 loggregator API when sending data to the metron agent instead of the 'legacy' v1 API." default: false diff --git a/jobs/locket/spec b/jobs/locket/spec index 640651ffb..6c50d6346 100644 --- a/jobs/locket/spec +++ b/jobs/locket/spec @@ -67,10 +67,6 @@ properties: diego.locket.sql.ca_cert: description: "Bundle of CA certificates for the Locket to verify the SQL server SSL certificate when connecting via SSL" - logging.format.timestamp: - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." - default: "unix-epoch" - loggregator.use_v2_api: description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." default: false diff --git a/jobs/rep/spec b/jobs/rep/spec index c7e46eeb5..11d203b4c 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -215,6 +215,9 @@ properties: diego.executor.max_log_lines_per_second: description: "EXPERIMENTAL: Maximum log lines allowed per second per app instance. Default value of 0 will disable rate limiting. Minimum recommended value is 100." default: 0 + diego.executor.declarative_healthcheck_default_timeout: + description: "Default timeout for declarative healthcheck. This value is used when the LRP spec does not specify a timeout. Only used if 'enable_declarative_healthcheck' is set to true." + default: "1s" </pre>

Component	Version	Release Notes
		<pre> diego.rep.bbs.api_location:   description: "Address of the BBS server" @@ -332,10 +335,6 @@ properties:   default: []   example: [ "169.254.0.2:15001" ] -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   logging.max_data_string_length:     description: "Length in bytes above which l ogged strings will be truncated. If set to 0, turns off truncation."     default: 640     diff --git a/jobs/rep_windows/spec b/jobs/r ep_windows/spec       index 3383a8bf4..161bc2821 100644       --- a/jobs/rep_windows/spec       +++ b/jobs/rep_windows/spec       @@ -61,10 +61,6 @@ properties:         description: "Add more permissive ACLs to d irectories that are bind mounted into contain ers. Required for Windows 2016 cells"         default: false -      logging.format.timestamp: -        description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -          default: "unix-epoch" -   logging.max_data_string_length:     description: "Length in bytes above which l ogged strings will be truncated. If set to 0, turns off truncation."     default: 640     @@ -207,6 +203,9 @@ properties:       diego.executor.max_log_lines_per_second:         description: "EXPERIMENTAL: Maximum log lin es allowed per second per app instance. Defau lt value of 0 will disable rate limiting. Min imum recommended value is 100."         default: 0 +      diego.executor.declarative_healthcheck_d efault_timeout: +        description: "Default timeout for decl arative healthcheck. This value is used when the LRP spec does not specify a timeout. Only used if 'enable_declarative_healthcheck' is s et to true." +        default: "1s"       diego.rep.bbs.api_location:         description: "Address of the BBS server"         diff --git a/jobs/route_emitter/spec b/job s/route_emitter/spec           index df1b8383c..e35eddfb4 100644 </pre>

Component	Version	Release Notes
		<pre> --- a/jobs/route_emitter/spec +++ b/jobs/route_emitter/spec @@ -105,10 +105,6 @@ properties:   description: "Experimental: Enable the route-emitter to emit registrations for internal DNS-based service discovery."   default: false -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   tcp.enabled:     description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API."     default: false   diff --git a/jobs/route_emitter_windows/spec b/jobs/route_emitter_windows/spec   index 9db9e8b69..e5a7ac46d 100644 --- a/jobs/route_emitter_windows/spec +++ b/jobs/route_emitter_windows/spec @@ -91,10 +91,6 @@ properties:   description: "The name of the Diego job referenced by this spec (DO NOT override)"   default: "route_emitter_windows" -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   syslog_daemon_config.address:     description: "Syslog host"     default: ""   diff --git a/jobs/ssh_proxy/spec b/jobs/ssh_proxy/spec   index cd39dbd52..fe63cfa97 100644 --- a/jobs/ssh_proxy/spec +++ b/jobs/ssh_proxy/spec @@ -120,10 +120,6 @@ properties:   description: "Connect directly to container IP instead of to the host IP and external port. Suitable only for deployments in which the gorouters and TCP routers can route directly to the container IP of instances."   default: false -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   loggregator.use_v2_api:     description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." </pre>

Component	Version	Release Notes
		<pre>default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.117.0...v2.118.0">https://github.com/cloudfoundry/diego-release/compare/v2.117.0...v2.118.0</a> ## Resources - [Download release 2.118.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.118.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.118.0</a>).</pre>

Component	Version	Release Notes
dotnet-core-offline-buildpack	2.4.73	<p>▼ v2.4.73</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.50.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.50.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cflinuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4       libunwind   1.8.1   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.17.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> <p>▼ v2.4.72</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.49.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.49.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dotnet-runtime   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cflinuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4 </pre>

Component	Version	Release Notes
		<pre>   libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre>

#### ▼ v2.4.71

```

Buildpacks provided by this bosh release:
- dotnet-core_buildpack-cached-cflinuxfs3-v
2.4.49.zip
- dotnet-core_buildpack-cached-cflinuxfs4-v
2.4.49.zip
## Packaged Binaries
| Name | Version | CF Stacks |
|---|---|---|
| dotnet-runtime | 8.0.15 | cflinuxfs4, cfl
inuxfs3 |
| dotnet-runtime | 9.0.4 | cflinuxfs4, cfl
inuxfs3 |
| dotnet-sdk | 8.0.408 | cflinuxfs4, cflinu
xfs3 |
| dotnet-sdk | 9.0.203 | cflinuxfs4, cflinu
xfs3 |
| libgdiplus | 6.1 | cflinuxfs3, cflinuxfs4
|
| libunwind | 1.8.1 | cflinuxfs3, cflinuxfs
4 |
| node | 20.16.0 | cflinuxfs3 |
| node | 22.14.0 | cflinuxfs4 |
| bower | 1.8.14 | cflinuxfs4, cflinuxfs3 |
| dotnet-aspnetcore | 8.0.15 | cflinuxfs4,
cflinuxfs3 |
| dotnet-aspnetcore | 9.0.4 | cflinuxfs4, c
flinuxfs3 |
## Default Versions
| Name | Version |
|---|---|
| dotnet-runtime | 8.0.x |
| dotnet-aspnetcore | 8.0.x |
| dotnet-sdk | 8.0.x |
| bower | 1.8.x |

```

Component	Version	Release Notes
garden-runc	1.73.0	<p>▼ v1.73.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 1.73.0 **Release Date**: June 11, 2025 ## Changes - Dependency Bumps - Bumped garden to 1.24.4 - Bumped containerd to 2.1.0 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.72.0...v1.73.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.72.0...v1.73.0</a> ## Resources - [Download release 1.73.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.73.0).</pre></div>

Component	Version	Release Notes
go-offline-buildpack	1.10.71	<p>▼ v1.10.71</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.45.zip - go_buildpack-cached-cflinuxfs4-v1.10.45.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    go   1.23.10   cflinuxfs3, cflinuxfs4     go   1.24.5   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
		<p>▼ v1.10.70</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.44.zip - go_buildpack-cached-cflinuxfs4-v1.10.44.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
		<p>▼ v1.10.69</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.44.zip - go_buildpack-cached-cflinuxfs4-v1.10.44.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4  </pre>

Component	Version	Release Notes
		<pre>  godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version     ---   ---     go   1.23.x  </pre>

Component	Version	Release Notes
java-offline-buildpack	4.85.0	<p>▼ v4.85.0</p> <pre> Buildpacks provided by this bosh release:   - java-buildpack-offline-cflinuxfs3-v4.83.0.zip   - java-buildpack-offline-cflinuxfs4-v4.83.0.zip       Dependency   Version   CVEs   Release Notes         -----   -----   ----   -----       --         AppDynamics Agent   `25.6.0_37159`     [Release Notes] (<a href="https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes">https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes</a>)         Azure Application Insights Agent   `3.7.3`     [Release Notes] (<a href="https://github.com/Microsoft/ApplicationInsights-Java/releases">https://github.com/Microsoft/ApplicationInsights-Java/releases</a>)         CA Introscope APM Framework   `25.5.1_11`                 Client Certificate Mapper   `2.0.1`   Included inline above   Included inline above         Container Security Provider   `1.20.0_REL_EASE`   Included inline above   Included inline above         Contrast Security Agent   `6.19.0`     [Release Notes] (<a href="https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html">https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html</a>)         Datadog APM Javaagent   `1.50.1`     [Release Notes] (<a href="https://github.com/DataDog/dd-trace-java/releases">https://github.com/DataDog/dd-trace-java/releases</a>)         Elastic APM Agent   `1.54.0`     [Release Notes] (<a href="https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html</a>)         Gemalto Luna Security Provider   `7.4.0`     [Release Notes] (<a href="https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm">https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm</a>)         Geode Tomcat Session Store   `2.0.3`                 Google Stackdriver Profiler   `0.1.0`     [Release Notes] (<a href="https://cloud.google.com/profiler/docs/release-notes">https://cloud.google.com/profiler/docs/release-notes</a>)         Groovy   `2.5.23`     [Release Notes] (<a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a>)         JaCoCo Agent   `0.8.13`     [Release Notes] (<a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a>)               Java CFEnv   `3.4.0`     [Release Notes] (<a href="https://github.com/pivotal-cf/java-cfenv/releases">https://github.com/pivotal-cf/java-cfenv/releases</a>)         Java Memory Assistant Agent   `0.5.0`                 Java Memory Assistant Clean Up   `0.1.0`                 JProfiler Profiler   `15.0.2`     [Change</pre>

Component	Version	Release Notes
		<p>Log] (<a href="https://www.ej-technologies.com/downloads/jprofiler/changelog.html">https://www.ej-technologies.com/downloads/jprofiler/changelog.html</a>)      JRebel Agent   `2025.3.0`     [ChangeLog] (<a href="https://www.jrebel.com/products/jrebel/changelog">https://www.jrebel.com/products/jrebel/changelog</a>)      jvmkill Agent   `1.17.0_RELEASE`   Included inline above   Included inline above      MariaDB JDBC Driver   `2.7.9`     [Release Notes] (<a href="https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/">https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/</a>)      Memory Calculator   `3.13.0_RELEASE`   Included inline above   Included inline above      Metric Writer   `3.5.0_RELEASE`   Included inline above   Included inline above      New Relic Agent   `8.22.0`     [Release Notes] (<a href="https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/">https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/</a>)      Open Telemetry Agent   `2.17.0`     [Release Notes] (<a href="https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases">https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases</a>)         OpenJDK JRE 11   `11.0.27_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/</a>)      OpenJDK JRE 17   `17.0.15_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/</a>)      OpenJDK JRE 21   `21.0.7_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/</a>)      OpenJDK JRE 8   `1.8.0_452`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/</a>)      PostgreSQL JDBC Driver   `42.7.7`     [ChangeLog] (<a href="https://jdbc.postgresql.org/documentation/changelog.html">https://jdbc.postgresql.org/documentation/changelog.html</a>)      Redis Session Store   `1.3.6_RELEASE`   Included inline above   Included inline above      Riverbed Appinternals Agent   `11.8.5_BL527`          SeaLights Agent   `4.0.2570`          SkyWalking   `9.4.0`     [ChangeLog] (<a href="https://github.com/apache/skywalking/tree/master/changes">https://github.com/apache/skywalking/tree/master/changes</a>)      Splunk OpenTelemetry Java Agent   `2.17.0`     [Release Notes] (<a href="https://github.com/signalfx/splunk-otel-java/releases">https://github.com/signalfx/splunk-otel-java/releases</a>)      Spring Auto-reconfiguration   `2.12.0_REL`       </p>

Component	Version	Release Notes
		<pre>EASE`   Included inline above   Included inline above     Spring Boot CLI   `2.7.18`         Spring Boot Container Customizer   `2.6.0 _RELEASE`   Included inline above   Included inline above     Spring Kit CLI   `0.4.0`         Takipi Agent   `4.82.3`     [Release Notes] (<a href="https://doc.overops.com/docs/whats-new">https://doc.overops.com/docs/whats-new</a>)     Tomcat 10.1   `10.1.41`   [Security] (<a href="https://tomcat.apache.org/security-10.html">https://tomcat.apache.org/security-10.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-10.1-doc/changelog.html">https://tomcat.apache.org/tomcat-10.1-doc/changelog.html</a>)     Tomcat 9   `9.0.105`   [Security] (<a href="https://tomcat.apache.org/security-9.html">https://tomcat.apache.org/security-9.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-9.0-doc/changelog.html">https://tomcat.apache.org/tomcat-9.0-doc/changelog.html</a>)     Tomcat Access Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above     Tomcat Lifecycle Support   `3.4.0_RELEASE`   Included inline above   Included inline above     Tomcat Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above     YourKit Profiler   `2025.3.151`     [Release Notes] (<a href="https://www.yourkit.com/download/yjp_2024_9_builds.jsp">https://www.yourkit.com/download/yjp_2024_9_builds.jsp</a>)  </pre>

#### ▼ v4.84.1

Buildpacks provided by this bosh release:

- java-buildpack-offline-cflinuxfs3-v4.82.0.zip
- java-buildpack-offline-cflinuxfs4-v4.82.0.zip

I'm pleased to announce the release of the `java-buildpack`, version `4.82.0`.

This release includes dependency updates, including for Tomcat 9 & 10.1 and the latest Java patch releases.

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	`25.2.0_36823`		[Release Notes] ( <a href="https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes">https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes</a> )
Azure Application Insights Agent	`3.7.2`		[Release Notes] ( <a href="https://github.com/Microsoft/ApplicationInsights-Java/releases">https://github.com/Microsoft/ApplicationInsights-Java/releases</a> )
CA Introscope APM Framework	`25.5.1_11`		
Client Certificate Mapper	`2.0.1`		Included inline above

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>  Container Security Provider   `1.20.0_RELEASE`   Included inline above   Included inline above         <ul style="list-style-type: none"> <li>  Contrast Security Agent   `6.16.0`     [Release Notes] (<a href="https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html">https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html</a>)  </li> <li>  Datadog APM Javaagent   `1.49.0`     [Release Notes] (<a href="https://github.com/DataDog/dd-trace-java/releases">https://github.com/DataDog/dd-trace-java/releases</a>)  </li> <li>  Elastic APM Agent   `1.53.0`     [Release Notes] (<a href="https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html</a>)  </li> <li>  Gemalto Luna Security Provider   `7.4.0`     [Release Notes] (<a href="https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm">https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm</a>)  </li> <li>  Geode Tomcat Session Store   `2.0.3`    </li> <li>  Google Stackdriver Profiler   `0.1.0`     [Release Notes] (<a href="https://cloud.google.com/profiler/docs/release-notes">https://cloud.google.com/profiler/docs/release-notes</a>)  </li> <li>  Groovy   `2.5.23`     [Release Notes] (<a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a>)  </li> <li>  JaCoCo Agent   `0.8.13`     [Release Notes] (<a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a>)  </li> <li>  Java CFEnv   `3.4.0`     [Release Notes] (<a href="https://github.com/pivotal-cf/java-cfenv/releases">https://github.com/pivotal-cf/java-cfenv/releases</a>)  </li> <li>  Java Memory Assistant Agent   `0.5.0`    </li> <li>  Java Memory Assistant Clean Up   `0.1.0`    </li> <li>  JProfiler Profiler   `13.0.7`     [Change Log] (<a href="https://www.ej-technologies.com/download/jprofiler/changelog.html">https://www.ej-technologies.com/download/jprofiler/changelog.html</a>)  </li> <li>  JRebel Agent   `2025.2.1`     [ChangeLog] (<a href="https://www.jrebel.com/products/jrebel/changelog">https://www.jrebel.com/products/jrebel/changelog</a>)  </li> <li>  jvmkill Agent   `1.17.0_RELEASE`   Included inline above   Included inline above         <ul style="list-style-type: none"> <li>  MariaDB JDBC Driver   `2.7.9`     [Release Notes] (<a href="https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/">https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/</a>)  </li> <li>  Memory Calculator   `3.13.0_RELEASE`   Included inline above   Included inline above             <ul style="list-style-type: none"> <li>  Metric Writer   `3.5.0_RELEASE`   Included inline above   Included inline above                 <ul style="list-style-type: none"> <li>  New Relic Agent   `8.20.0`     [Release Notes] (<a href="https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/">https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/</a>)  </li> <li>  Open Telemetry Agent   `2.15.0`     [Release Notes] (<a href="https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases">https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases</a>)  </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li></ul>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>  OpenJDK JRE 11   `11.0.27_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/</a>)  </li> <li>  OpenJDK JRE 17   `17.0.15_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/</a>)  </li> <li>  OpenJDK JRE 21   `21.0.7_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/</a>)  </li> <li>  OpenJDK JRE 8   `1.8.0_452`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/</a>)  </li> <li>  PostgreSQL JDBC Driver   `42.7.5`     [ChangeLog] (<a href="https://jdbc.postgresql.org/documentation/changelog.html">https://jdbc.postgresql.org/documentation/changelog.html</a>)  </li> <li>  Redis Session Store   `1.3.6_RELEASE`   Included inline above   Included inline above  </li> <li>  Riverbed Appinternals Agent   `11.8.5_BL527`      </li> <li>  SeaLights Agent   `4.0.2570`      </li> <li>  SkyWalking   `9.4.0`     [ChangeLog] (<a href="https://github.com/apache/skywalking/tree/master/changes">https://github.com/apache/skywalking/tree/master/changes</a>)  </li> <li>  Splunk OpenTelemetry Java Agent   `2.10.0`     [Release Notes] (<a href="https://github.com/signalfx/splunk-otel-java/releases">https://github.com/signalfx/splunk-otel-java/releases</a>)  </li> <li>  Spring Auto-reconfiguration   `2.12.0_RELEASE`   Included inline above   Included inline above  </li> <li>  Spring Boot CLI   `2.7.18`      </li> <li>  Spring Boot Container Customizer   `2.6.0_RELEASE`   Included inline above   Included inline above  </li> <li>  Spring Kit CLI   `0.4.0`      </li> <li>  Takipi Agent   `4.73.3`     [Release Notes] (<a href="https://doc.overops.com/docs/whats-new">https://doc.overops.com/docs/whats-new</a>)  </li> <li>  Tomcat 10.1   `10.1.41`   [Security] (<a href="https://tomcat.apache.org/security-10.html">https://tomcat.apache.org/security-10.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-10.1-doc/changelog.html">https://tomcat.apache.org/tomcat-10.1-doc/changelog.html</a>)  </li> <li>  Tomcat 9   `9.0.105`   [Security] (<a href="https://tomcat.apache.org/security-9.html">https://tomcat.apache.org/security-9.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-9.0-doc/changelog.html">https://tomcat.apache.org/tomcat-9.0-doc/changelog.html</a>)  </li> <li>  Tomcat Access Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above  </li> <li>  Tomcat Lifecycle Support   `3.4.0_RELEASE`   Included inline above   Included inline ab</li> </ul>

Component	Version	Release Notes
		<pre> ove     Tomcat Logging Support   `3.4.0_RELEASE`     Included inline above   Included inline above     YourKit Profiler   `2025.3.135`     [Release Notes] (<a href="https://www.yourkit.com/download/yjp_2024_9_builds.jsp">https://www.yourkit.com/download/yjp_2024_9_builds.jsp</a>)   </pre>
java-native-image-cnb-buildpack	0.11.22	
log-cache	3.2.0	
loggregator	107.0.21	
loggregator-agent	8.3.8	
metric-registrar	4.0.8	
mysql-monitoring	10.26.0	<p>▼ v10.26.0</p> <pre> ## Release Notes **Dependency bumps** - Updates packages and dependencies - Updates golang to 1.24.4 **Features** - Adds new metrics to support developers when reviewing I/O performance </pre>

Component	Version	Release Notes
nats	56.52.0	<p>▼ v56.52.0</p> <pre> ## 56.52.0 **Release Date**: July 15, 2025 ## Go Package Updates * Bumped go.mod package 'code.cloudfoundry.org/cf-networking-helpers' from 'v0.48.0' to 'v0.50.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' * Bumped go.mod package 'golang.org/x/crypt/o' from 'v0.39.0' to 'v0.40.0' * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0' * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0' * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0' ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.51.0...v56.52.0">https://github.com/cloudfoundry/nats-release/compare/v56.51.0...v56.52.0</a> ## Resources - [Download release 56.52.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.52.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.52.0</a>).</pre>
		<p>▼ v56.51.0</p> <pre> ## 56.51.0 **Release Date**: July 07, 2025 ## Changes - Bump nats-server from 2.11.4 to 2.11.6 - Bump tlsconfig from v0.29.0 to v0.30.0 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.50.0...v56.51.0">https://github.com/cloudfoundry/nats-release/compare/v56.50.0...v56.51.0</a> ## Resources - [Download release 56.51.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.51.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.51.0</a>).</pre>
		<p>▼ v56.50.0</p> <pre> ## 56.50.0 **Release Date**: June 23, 2025 ## Changes - Dependency bumps</pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
		<pre> ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.49.0...v56.50.0">https://github.com/cloudfoundry/nats-release/compare/v56.49.0...v56.50.0</a> ## Resources - [Download release 56.50.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.50.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.50.0</a>).  ▼ v56.49.0  ## 56.49.0 **Release Date**: June 16, 2025 ## Changes - Dependency bumps ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.48.0...v56.49.0">https://github.com/cloudfoundry/nats-release/compare/v56.48.0...v56.49.0</a> ## Resources - [Download release 56.49.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.49.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.49.0</a>). </pre>
nats-monitor	0.0.9	

Component	Version	Release Notes
nfs-volume	7.32.0	<p>▼ v7.32.0</p> <pre> ## 7.32.0 **Release Date**: July 15, 2025 ## Go Package Updates for "dockerdriver" * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' ## Go Package Updates for "mapfs" * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0' * Bumped go.mod package 'code.cloudfoundry.org/volumedriver' from 'v0.127.0' to 'v0.129.0' * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0' * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0' * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0' * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0' * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0' ## Go Package Updates for "mapfs-performanc-e-acceptance-tests" * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0' * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0' * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0' ## Go Package Updates for "nfsbroker" * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.54.0' to 'v0.57.0' * Bumped go.mod package 'code.cloudfoundry.org/existingvolumebroker' from 'v0.173.0' to 'v0.175.0' * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0' * Bumped go.mod package 'code.cloudfoundry.org/service-broker-store' from 'v0.120.0' to 'v0.122.0' * Bumped go.mod package 'code.cloudfoundry.org/volume-mount-options' from 'v0.124.0' to 'v0.126.0' * Bumped go.mod package 'github.com/cloudfdry/socks5-proxy' from 'v0.2.155' to 'v0.2.156' * Bumped go.mod package 'golang.org/x/crypt </pre>

Component	Version	Release Notes
		<pre> o' from 'v0.39.0' to 'v0.40.0'   * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0'     * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0'       * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0'         * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0'           * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'             * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0'               ## Go Package Updates for "nfsv3driver"               * Bumped go.mod package 'code.cloudfoundry.org/cf-networking-helpers' from 'v0.49.0' to 'v0.50.0'                 * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.54.0' to 'v0.57.0'                   * Bumped go.mod package 'code.cloudfoundry.org/dockerdriver' from 'v0.54.0' to 'v0.55.0'                     * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0'                       * Bumped go.mod package 'code.cloudfoundry.org/volume-mount-options' from 'v0.124.0' to 'v0.126.0'                         * Bumped go.mod package 'code.cloudfoundry.org/volumedriver' from 'v0.127.0' to 'v0.129.0'                           * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0'                             * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0'                               * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0'                                 * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0'                                   * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'                                     * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0'                                       ## Built with go 1.24.4                                       **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.31.0...v7.32.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.31.0...v7.32.0</a>                                       ## Resources                                       - [Download release 7.32.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.32.0). </pre>
		<p>▼ v7.31.0</p> <pre> ## 7.31.0 **Release Date**: July 11, 2025 ## Blob Updates * Bumped blob openssl from '3.5.0' to '3.5.1' </pre>

Component	Version	Release Notes
		<pre> ## Go Package Updates for "dockerdriver" * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "mapfs" * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "mapfs-performanc e-acceptance-tests" * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "nfsbroker" * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.54.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'code.cloudfoundry.org/credhub-cli' from 'v0.0.0-20250616130814-79ad10d5e505' to 'v0.0.0-20250630133601-61e52f0de0d8' * Bumped go.mod package 'github.com/cloudf undry/socks5-proxy' from 'v0.2.154' to 'v0.2.155' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "nfsv3driver" * Bumped go.mod package 'code.cloudfoundry.org/cf-networking-helpers' from 'v0.48.0' to 'v0.49.0' * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.54.0' * Bumped go.mod package 'code.cloudfoundry.org/dockerdriver' from 'v0.53.0' to 'v0.54.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0' * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.30.0...v7.31.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.30.0...v7.31.0</a> ## Resources - [Download release 7.31.0 from bosh.io](ht </pre>

Component	Version	Release Notes
		<p><a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.31.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.31.0</a>.</p> <p>▼ v7.30.0</p> <pre> ## 7.30.0 **Release Date**: June 26, 2025 ## Changes - Allows operators to completely override the metadata used by BBR for backup + restore locks ## Bosh Job Spec changes: ```diff diff --git a/jobs/nfsbroker-bbr-lock/spec b/jobs/nfsbroker-bbr-lock/spec index 101e79dc..8abee21e 100644 --- a/jobs/nfsbroker-bbr-lock/spec +++ b/jobs/nfsbroker-bbr-lock/spec @@ -11,3 +11,31 @@ consumes: - name: nfsbrokerpush type: nfsbrokerpush +properties: + bbr.metadata: +   description: "BBR Metadata" +   default:   +     --- +   backup_should_be_locked_before: +     - job_name: uaa +       release: uaa +     - job_name: credhub +       release: credhub +     - job_name: cloud_controller_ng +       release: capi +     - job_name: cloud_controller_worker +       release: capi +     - job_name: cc_deployment_updater +       release: capi + +   restore_should_be_locked_before: +     - job_name: uaa +       release: uaa +     - job_name: credhub +       release: credhub +     - job_name: cloud_controller_ng +       release: capi +     - job_name: cloud_controller_worker +       release: capi +     - job_name: cc_deployment_updater +       release: capi ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.29.0...v7.30.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.29.0...v7.30.0</a> ## Resources - [Download release 7.30.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.30.0) </pre>

Component	Version	Release Notes
		<p>y/nfs-volume-release?version=7.30.0).</p> <p>▼ v7.29.0</p> <pre> ## 7.29.0 **Release Date**: June 24, 2025 ## Changes - Bump to OpenLDAP 2.6.10 for testing - Bump to Golang 1.24.4 - △Removed the ability for operators to configure logging timestamps. RFC3339 timestamps are now always used. ## Bosh Job Spec changes: ```diff diff --git a/jobs/nfsbrokerpush/spec b/jobs/nfsbrokerpush/spec index bb67a949..b8919abf 100644 --- a/jobs/nfsbrokerpush/spec +++ b/jobs/nfsbrokerpush/spec @@ -123,6 +123,3 @@ properties: nfsbrokerpush.log_level: description: "nfsbroker log level" default: "info" - nfsbrokerpush.log_time_format: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "rfc3339" diff --git a/jobs/nfsv3driver/spec b/jobs/nfsv3driver/spec index 7d5262d8..ceb3f10d 100644 --- a/jobs/nfsv3driver/spec +++ b/jobs/nfsv3driver/spec @@ -42,9 +42,6 @@ properties: nfsv3driver.log_level: description: "nfsv3driver log level" default: "info" - nfsv3driver.log_time_format: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "rfc3339" nfsv3driver.disable: description: "disable nfsv3driver" default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.28.0...v7.29.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.28.0...v7.29.0</a> ## Resources - [Download release 7.29.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.29.0). </pre>

Component	Version	Release Notes
nginx-offline-buildpack	1.2.61	<p>▼ v1.2.61</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 9.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 9.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.28.0   cflinuxfs3, cflinuxfs4     nginx   1.29.0   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    --- ---    nginx   1.29.x  </pre>
		<p>▼ v1.2.60</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 8.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.2.59</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 7.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    openresty   1.21.4.3   cflinuxfs3, cflinu xfs4  </pre>

Component	Version	Release Notes
		<pre>   openresty   1.25.3.2   cflinuxfs3, cflinu xfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x   </pre> <p>▼ v1.2.58</p> <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 7.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x   </pre>

Component	Version	Release Notes
nodejs-offline-buildpack	1.8.72	<p>▼ v1.8.72</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 8.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   20.19.0   cflinuxfs3, cflinuxfs4     node   20.19.3   cflinuxfs3, cflinuxfs4     node   22.16.0   cflinuxfs4     node   22.17.0   cflinuxfs4     node   24.3.0   cflinuxfs4     node   24.4.0   cflinuxfs4     python   3.11.13   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   20.x     python   3.11.x   </pre>
		<p>▼ v1.8.71</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 7.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.11.13   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3     node   20.19.0   cflinuxfs3, cflinuxfs4     node   20.19.3   cflinuxfs3, cflinuxfs4     node   22.15.1   cflinuxfs4     node   22.16.0   cflinuxfs4     node   24.3.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    node   20.x     python   3.11.x   </pre>
		<p>▼ v1.8.70</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 7.zip </pre>

Component	Version	Release Notes
		<pre> - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.11.13   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs4, cflinuxfs3     node   20.19.0   cflinuxfs3, cflinuxfs4     node   20.19.3   cflinuxfs3, cflinuxfs4     node   22.15.1   cflinuxfs4     node   22.16.0   cflinuxfs4     node   24.3.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    node   20.x     python   3.11.x   </pre> <p>▼ v1.8.69</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 7.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.11.13   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs4, cflinuxfs3     node   20.19.0   cflinuxfs3, cflinuxfs4     node   20.19.3   cflinuxfs3, cflinuxfs4     node   22.15.1   cflinuxfs4     node   22.16.0   cflinuxfs4     node   24.3.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    node   20.x     python   3.11.x   </pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
notifications	81.0.3	<p>▼ v81.0.3</p> <ul style="list-style-type: none"> <li>* update spec to be prepended by the job name</li> </ul> <p>▼ v81.0.2</p> <ul style="list-style-type: none"> <li>* update dependency</li> <li>* add ability to configure bbr</li> </ul> <p>▼ v81.0.1</p> <ul style="list-style-type: none"> <li>* use the new correct path for the module</li> <li>* fix go mod for acceptance</li> </ul> <p>▼ v81.0.0</p> <ul style="list-style-type: none"> <li>* remove warrant from main code</li> <li>* update golang</li> </ul>
notifications-ui	57.0.1	<p>▼ v57.0.1</p> <ul style="list-style-type: none"> <li>* update golang</li> </ul>
otel-collector	0.11.4	

Component	Version	Release Notes
php-offline-buildpack	4.6.60	<p>▼ v4.6.60</p> <pre>Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.35.zip - php_buildpack-cached-cflinuxfs4-v4.6.35.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.12.4   cflinuxfs3, cflinuxfs4     ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3     httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8  </pre> <p>▼ v4.6.59</p> <pre>Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.35.zip - php_buildpack-cached-cflinuxfs4-v4.6.35.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.12.4   cflinuxfs3, cflinuxfs4     ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3     httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4  </pre>

Component	Version	Release Notes
		<pre> uxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8   </pre>
push-apps-manager-release	677.0.80	<p>▼ 677.0.80</p> <ul style="list-style-type: none"> <li>* Load app health for all apps bound to routes</li> <li>* update dependencies</li> </ul> <p>▼ 677.0.79</p> <ul style="list-style-type: none"> <li>* show difference between tanzu cli and tanzu cli installers on cli download page. Allow downloading both</li> <li>* update dependencies</li> </ul> <p>▼ 677.0.78</p> <ul style="list-style-type: none"> <li>* allow overriding bbr metadata for new uaa</li> <li>* update to show warning when there are more than two scheduler instances</li> <li>* add ability for those with only view only permissions to access autoscaler data</li> <li>* update dependencies</li> </ul> <p>▼ 677.0.77</p> <ul style="list-style-type: none"> <li>* update dependencies</li> <li>* update os selecting logic for tanzu-cli</li> </ul>
push-offline-docs-release	6.0.176	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
push-usage-service-release	674.0.177	<p>▼ v674.0.177</p> <pre>## Changes * creating final release 674.0.176</pre> <p>▼ v674.0.176</p> <pre>## Changes * Fix pdrats (#51) * TNZ-47208 - Update routing-api's bbr meta data to be overridable with a bosh property (#45) * creating final release 674.0.175</pre> <p>▼ v674.0.175</p> <pre>## Changes * creating final release 674.0.174</pre> <p>▼ v674.0.174</p> <pre>## Changes * creating final release 674.0.173</pre> <p>▼ v674.0.173</p> <pre>## Changes * creating final release 674.0.172</pre> <p>▼ v674.0.172</p> <pre>## Changes * Fix max concurrent value from being calcu lated incorrectly * Replace CUPS with /metrics endpoint * creating final release 674.0.171</pre>

Component	Version	Release Notes
pxc	1.1.1	<p>▼ v1.1.1</p> <pre> ## IMPORTANT **Important** As of v1.1.0 and later, pxc-release now supports deploying with Percona XtraDB Cluster v8.4.  MySQLv8.0 will be reaching EOL in April 2026, so all users are advised to begin making preparations and plans for migrating to 8.4  To use Percona XtraDB Cluster v8.4, set the [pxc-mysql job's mysql_version property] (<a href="https://github.com/cloudfoundry/pxc-release/blob/a4d210b37a8dfc32d9f498e52b594ddbb4a332db/jobs/pxc-mysql/spec#L380-L382">https://github.com/cloudfoundry/pxc-release/blob/a4d210b37a8dfc32d9f498e52b594ddbb4a332db/jobs/pxc-mysql/spec#L380-L382</a>) to "8.4".  The default MySQL version remains "8.0" for compatibility with existing consumers but the default will change in a future major version bump.  As with any major database version upgrade, testing and ensuring backups prior to a major version upgrade in production is strongly encouraged.  ## Release Notes **Dependency bumps** - Updates packages and dependencies **Bugs fixed** - Updated the pxc-mysql job spec to correctly indicate "8.4" as a valid option on the mysql_version property **New Features** - Add new job for `percona-xtrabackup-8.4`</pre> <p>▼ v1.1.0</p> <pre> ## IMPORTANT **Important** As of v1.1.0 and later, pxc-release now supports deploying with Percona XtraDB Cluster v8.4.  MySQLv8.0 will be reaching EOL in April 2026, so all users are advised to begin making preparations and plans for migrating to 8.4  To use Percona XtraDB Cluster v8.4, set the [pxc-mysql job's mysql_version property] (<a href="https://github.com/cloudfoundry/pxc-release/blob/a4d210b37a8dfc32d9f498e52b594ddbb4a332db/jobs/pxc-mysql/spec#L380-L382">https://github.com/cloudfoundry/pxc-release/blob/a4d210b37a8dfc32d9f498e52b594ddbb4a332db/jobs/pxc-mysql/spec#L380-L382</a>) to "8.4".  The default MySQL version remains "8.0" for compatibility with existing consumers but the default will change in a future major version bump.  As with any major database version upgrade, testing and ensuring backups prior to a major version upgrade in production is strongly encouraged.  ## Release Notes **Dependency bumps**</pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- Updates packages and dependencies</li> <li>- Adds [Percona XtraDB Cluster v8.4.4-4] (<a href="https://docs.percona.com/percona-xtradb-cluster/8.4/release-notes/8.4.4-4.html">https://docs.percona.com/percona-xtradb-cluster/8.4/release-notes/8.4.4-4.html</a>)</li> <li>- Adds [Percona XtraBackup v8.4.0-3] (<a href="https://docs.percona.com/percona-xtrabackup/8.4/release-notes/8.4.0-3.html">http://docs.percona.com/percona-xtrabackup/8.4/release-notes/8.4.0-3.html</a>)</li> </ul> <p>▼ v1.0.42</p> <pre> ## Release Notes **Dependency bumps** - Updates packages and dependencies - Upgrades to Percona XtraDB Cluster v8.0.4 2-33 - Upgrades to Percona Xtrabackup v8.0.35-33 - Updates golang to 1.24.4 ## IMPORTANT This is intended to be the last release in the pxc-release v1.0 series. Future changes a nd features will be released with the upcomin g version v1.1 series, which includes support for MySQL 8.4.  MySQLv8.0 will be reaching EOL in April 202 6, so all users are advised to begin making p reparations and plans for migrating to 8.4 </pre>

Component	Version	Release Notes
python-offline-buildpack	1.8.68	<p>▼ v1.8.68</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.5 0.zip - python_buildpack-cached-cflinuxfs4-v1.8.5 0.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.23   cflinuxfs3, cflinuxfs4       python   3.10.17   cflinuxfs3, cflinuxfs4       python   3.11.12   cflinuxfs3, cflinuxfs4       python   3.12.10   cflinuxfs3, cflinuxfs4       python   3.13.5   cflinuxfs3, cflinuxfs4       setuptools   80.9.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3     miniforge   24.7.1   cflinuxfs4, cflinuxf s3   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre> <p>▼ v1.8.67</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 9.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 9.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    setuptools   80.9.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3     miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.23   cflinuxfs3, cflinuxfs4 </pre>

Component	Version	Release Notes
		<pre>   python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre> <p>▼ v1.8.66</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 9.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 9.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    setuptools   80.9.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3     miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.23   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre>

Component	Version	Release Notes
r-offline-buildpack	1.2.55	<p>▼ v1.2.55</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.30.zip - r_buildpack-cached-cflinuxfs4-v1.2.30.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.4.3   cflinuxfs3, cflinuxfs4     r   4.5.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.2.54</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.29.zip - r_buildpack-cached-cflinuxfs4-v1.2.29.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.4.3   cflinuxfs3, cflinuxfs4     r   4.5.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.2.53</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.28.zip - r_buildpack-cached-cflinuxfs4-v1.2.28.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.2.52</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.28.zip - r_buildpack-cached-cflinuxfs4-v1.2.28.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4  </pre>

Component	Version	Release Notes
		<pre>  r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version     ---   ---  </pre>

Component	Version	Release Notes
routing	0.342.0	<p>▼ v0.342.0</p> <pre> ## 0.342.0 **Release Date**: July 07, 2025 ## Changes - Bump blob `jq` from 1.8.0 to 1.8.1 - Bump go package `tlsconfig` from v0.29.0 to v0.30.0 - Bump go package `github.com/cloudfoundry/cf-test-helpers/v2` from v2.12.0 to v2.13.0 - Bump go package `github.com/nats-io/nats-server/v2` from v2.11.4 to v2.11.5 - Bump go package `code.cloudfoundry.org/bbs` from `v0.0.0-20250414163106-a163a3b524d2` to `v0.0.0-20250627143703-e88b3ec8cd1e` - Bump go package `github.com/prometheus/common` from v0.64.0 to v0.65.0 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.341.0...v0.342.0">https://github.com/cloudfoundry/routing-release/compare/v0.341.0...v0.342.0</a> ## Resources - [Download release 0.342.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.342.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.342.0</a>).</pre> <p>▼ v0.341.0</p> <pre> ## 0.341.0 **Release Date**: June 24, 2025 ## Changes - Added the ability for operators to completely override the BBR metadata to control what restores block on. - △Removed the deprecated router.max_header_kb property. Please use router.max_request_header_kb. Thanks @kart2bc ! - △ Removed the ability for operators to configure logging timestamps. Only RFC3339 is permitted now. Thanks @kart2bc ! - Bumped to a newer version of the cf-cli for acceptance tests ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 8378da138..a9e55d41a 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -287,20 +287,13 @@ properties: router.route_services_strict_signature_validation: description: "Enforce strict validation of a route service signature" default: false - router.max_header_kb:</pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- description:  </li> <li>- Deprecated, use router.max_request_header_kb instead which is equivalent to this option.</li> <li>- default: 1024 # 1Mb</li> <li>router.max_request_header_kb:       <ul style="list-style-type: none"> <li>description:  </li> <li>This value controls the maximum number of bytes (in KB) the gorouter will read parsing the request header's keys and values, including the request line. It does not limit the size of the request body. Requests with larger headers will result in a 431 status code. Must be between 1 and 1024kb.</li> <li>- Note: This value takes precedence over router.max_header_kb but has no default to not break</li> <li>- existing setups. If you previously configured router.max_header_kb it is recommended to           <ul style="list-style-type: none"> <li>- switch to this property instead.</li> </ul> </li> <li>- example: 1024 # 1Mb</li> <li>+ default: 1024 # 1Mb</li> </ul> </li> <li>router.max_response_header_kb:       <ul style="list-style-type: none"> <li>description:  </li> <li>This value controls the maximum number of bytes (in KB) the gorouter will read</li> <li>@@ -352,13 +345,6 @@ properties:</li> <li>stderr logs.</li> <li>Available fields are: backend_time, dial_time, dns_time, failed_attempts, failed_attempt_time, local_address, tls_time</li> <li>default: []</li> <li>- router.logging.format.timestamp:</li> <li>- description:  </li> <li>- Format for timestamp in component logs. Valid values are 'rfc3339', 'deprecated', and 'unix-epoch'.</li> <li>- 'rfc3339' is the recommended format. It will result in all timestamps controlled by gorouter to be in RFC3339 format, which is human readable. This includes stdout, pre-start, and post-start logs. This does not include stderr logs from golang libraries.</li> <li>- 'deprecated' will result in all timestamps being in the format they were before the rfc3339 flag was introduced. This format is different for different logs. We do not recommend using this flag unless you have scripts that expect a particular timestamp format.</li> <li>- 'unix-epoch' is an old flag that we do not recommend using, but we are keeping for backwards compatibility. It will result in the gorouter logs to be in unix-epoch format. This does not effect pre-start or post-start logs. This does not effect stderr logs from g</li> </ul> </li> </ul>

Component	Version	Release Notes
		<pre> olang libaries. -   default: "rfc3339" router.enable_proxy:   description: "Enables support for the popular PROXY protocol, allowing downstream load balancers that do not support HTTP to pass along client information."   default: false diff --git a/jobs/routing-api/spec b/jobs/routing-api/spec index bea7e6ca1..751eefef 100644 --- a/jobs/routing-api/spec +++ b/jobs/routing-api/spec @@ -232,6 +232,13 @@ properties:   description: "Local port to listen on with admin endpoint (used for backup/restore locking)"   default: 15897 + routing_api.bbr.metadata: +   description: "BBR Metadata" +   default:   +     --- +   restore_should_be_locked_before: +     - job_name: uaa +       release: uaa release_level_backup: default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.340.0...v0.341.0">https://github.com/cloudfoundry/routing-release/compare/v0.340.0...v0.341.0</a> ## Resources - [Download release 0.341.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.341.0). </pre>

Component	Version	Release Notes
ruby-offline-buildpack	1.10.53	<p>▼ v1.10.53</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.3 1.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.3 1.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3       jruby   9.4.8.0   cflinuxfs3, cflinuxfs4       node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.2.8   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     ruby   3.3.8   cflinuxfs3, cflinuxfs4     ruby   3.4.2   cflinuxfs3, cflinuxfs4     ruby   3.4.4   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre> <p>▼ v1.10.52</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.3 1.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.3 1.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3       jruby   9.4.8.0   cflinuxfs3, cflinuxfs4       node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre>  ruby   3.2.8   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     ruby   3.3.8   cflinuxfs3, cflinuxfs4     ruby   3.4.2   cflinuxfs3, cflinuxfs4     ruby   3.4.4   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x  </pre>
web-servers-cnb-buildpack	0.15.2	

Component	Version	Release Notes
silk	3.72.0	<p>▼ v3.72.0</p> <pre> ## 3.72.0 **Release Date**: June 16, 2025 ## Changes - Breaking Change: remove `logging.format.timestamp` property from multiple jobs. - RFC339 forever! - <a href="https://github.com/cloudfoundry/silk-release/pull/159">https://github.com/cloudfoundry/silk-release/pull/159</a> - Thank you @kart2bc - Bump dependencies ## Bosh Job Spec changes: ```diff diff --git a/jobs/iptables-logger/spec b/jobs/iptables-logger/spec index d5ac9fe7..e9538f18 100644 --- a/jobs/iptables-logger/spec +++ b/jobs/iptables-logger/spec @@ -26,10 +26,3 @@ properties:  disable:  description: "Disable this monit job. It will not run. Required for backwards compatibility"  default: false - - logging.format.timestamp: -   description:   -     Format for timestamp in component logs. Valid values are 'rfc3339', 'deprecated'. -       'rfc3339' is the recommended format. It will result in all timestamps controlled by iptables-logger to be in RFC3339 format, which is human readable. -       'deprecated' will result in all timestamps being in the format they were before the rfc3339 flag was introduced. This format is different for different logs. We do not recommend using this flag unless you have scripts that expect a particular timestamp format. -   default: "rfc3339" diff --git a/jobs/silk-daemon/spec b/jobs/silk-daemon/spec index 572b08c9..b3c12b4e 100644 --- a/jobs/silk-daemon/spec +++ b/jobs/silk-daemon/spec @@ -105,14 +105,6 @@ properties:  description: "Log Level for silk-daemon to start with"  default: info - logging.format.timestamp: -   description:   -     Format for timestamp in the drain log. Valid values are 'rfc3339' and 'deprecated'. -       This property only affects the drain log because other component and bosh lifecycle logs were already in the rfc3339 format. -       'rfc3339' is the recommended form </pre>

Component	Version	Release Notes
		<p>t. It will result in all timestamps in the drain log controlled by silk-daemon to be in RFC3339 format, which is human readable. This does not include stderr logs from golang libraries.</p> <ul style="list-style-type: none"> <li>- 'deprecated' will result in all timestamps being in the format they were before the rfc3339 flag was introduced for the drain log. We do not recommend using this flag unless you have scripts that expect a particular timestamp format.</li> <li>- default: "rfc3339"</li> <li>-</li> </ul> <pre>healthchecker.failure_counter_file: description: "File used by the healthchecker to monitor consecutive failures." default: /var/vcap/data/silk-daemon/counters/consecutive_healthchecker_failures.count ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.71.0...v3.72.0">https://github.com/cloudfoundry/silk-release/compare/v3.71.0...v3.72.0</a> ## Resources - [Download release 3.72.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.72.0).</pre>

#### ▼ v3.71.0

```
## 3.71.0
**Release Date**: June 11, 2025
## Changes
- Dependency bumps
- Bumped to go 1.24.4
## Built with go 1.24.4
**Full Changelog**: https://github.com/cloudfoundry/silk-release/compare/v3.70.0...v3.71.0
## Resources
- [Download release 3.71.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.71.0).
```

Component	Version	Release Notes
smb-volume	3.30.0	<p>▼ v3.30.0</p> <pre> ## 3.30.0 **Release Date**: July 15, 2025 ## Go Package Updates for "dockerdriver" * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' * ## Go Package Updates for "smbbroker" * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.57.0' * Bumped go.mod package 'code.cloudfoundry.org/existingvolumebroker' from 'v0.173.0' to 'v0.175.0' * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'code.cloudfoundry.org/service-broker-store' from 'v0.120.0' to 'v0.122.0' * Bumped go.mod package 'code.cloudfoundry.org/volume-mount-options' from 'v0.124.0' to 'v0.126.0' * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/credhub-cli' from 'v0.0.0-20250616130814-79ad10d5e505' to 'v0.0.0-20250630133601-61e52f0de0d8' * Bumped go.mod package 'code.cloudfoundry.org/dockerdriver' from 'v0.53.0' to 'v0.55.0' * Bumped go.mod package 'code.cloudfoundry.org/volumedriver' from 'v0.127.0' to 'v0.129.0' * Bumped go.mod package 'github.com/cloudfoundry/socks5-proxy' from 'v0.2.154' to 'v0.2.156' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250629210550-e611ec304b22' to 'v0.0.0-20250630185457-6e76a2b096b5' * Bumped go.mod package 'golang.org/x/crypt/o' from 'v0.39.0' to 'v0.40.0' * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sys'</pre>

Component	Version	Release Notes
		<pre> from 'v0.33.0' to 'v0.34.0'   * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'   * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0'     ## Go Package Updates for "smbdriver"     * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.57.0'       * Bumped go.mod package 'code.cloudfoundry.org/dockerdriver' from 'v0.53.0' to 'v0.55.0'         * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0'           * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0'             * Bumped go.mod package 'code.cloudfoundry.org/volumedriver' from 'v0.127.0' to 'v0.129.0'               * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0'                 * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0'                   * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250629210550-e611ec304b22' to 'v0.0.0-20250630185457-6e76a2b096b5'                     * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0'                       * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0'                         * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0'                           * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0'                             * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'                               * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0'                                 ## Built with go 1.24.4                                 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.29.0...v3.30.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.29.0...v3.30.0</a>                                 ## Resources                                 - [Download release 3.30.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.30.0). </pre>

#### ▼ v3.29.0

```

## 3.29.0
**Release Date**: July 11, 2025
## Go Package Updates for smbbroker
* Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0'
  * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b3

```

Component	Version	Release Notes
		<pre> 6a' to 'v0.0.0-20250629210550-e611ec304b22'     ## Go Package Updates for smbdriver     * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0'         * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b3 6a' to 'v0.0.0-20250629210550-e611ec304b22'     ## Built with go 1.24.4     **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.28.0...v3.29.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.28.0...v3.29.0</a>     ## Resources     - [Download release 3.29.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.29.0). </pre>

#### ▼ v3.28.0

```

## 3.28.0
**Release Date**: June 24, 2025
## Changes
- Adds the ability for operators to completely override the bbr metadata for what jobs to block on during backup/restore events.
## Bosh Job Spec changes:
```diff
diff --git a/jobs/bbr-smbbroker/spec b/jobs/bbr-smbbroker/spec
index 8b8027d..54b451d 100644
--- a/jobs/bbr-smbbroker/spec
+++ b/jobs/bbr-smbbroker/spec
@@ -8,3 +8,32 @@ templates:
consumes:
- name: smbbrokerpush
type: smbbrokerpush
+
+properties:
+ bbr.metadata:
+   description: "BBR Metadata"
+   default: |
+     ---
+     backup_should_be_locked_before:
+       - job_name: uaa
+         release: uaa
+       - job_name: credhub
+         release: credhub
+       - job_name: cloud_controller_ng
+         release: capi
+       - job_name: cloud_controller_worker
+         release: capi
+       - job_name: cc_deployment_updater
+         release: capi
+
+       restore_should_be_locked_before:
+         - job_name: uaa
+           release: uaa
+         - job_name: credhub

```

Component	Version	Release Notes
		<pre> +       release: credhub +       - job_name: cloud_controller_ng +       release: capi +       - job_name: cloud_controller_worker +       release: capi +       - job_name: cc_deployment_updater +       release: capi ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.27.0...v3.28.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.27.0...v3.28.0</a>  ## Resources - [Download release 3.28.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.28.0). </pre>
		<p>▼ v3.27.0</p> <pre> ## 3.27.0 **Release Date**: June 23, 2025 ## Changes - Bump to golang 1.24.4 - ⚠️Breaking change: logging time formats are now only able to be the human-readable rfc339 format. Thanks @kart2bc! ## Bosh Job Spec changes: ```diff diff --git a/jobs/smbbrokerpush/spec b/jobs/smbbrokerpush/spec index 18030a3..ca6e9a6 100644 --- a/jobs/smbbrokerpush/spec +++ b/jobs/smbbrokerpush/spec @@ -119,6 +119,3 @@ properties: log_level: description: "smbbroker log level" default: "info" - log_time_format: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "rfc3339" diff --git a/jobs/smbdriver/spec b/jobs/smbdriver/spec index aa6dba3..e06b8df 100755 --- a/jobs/smbdriver/spec +++ b/jobs/smbdriver/spec @@ -35,9 +35,6 @@ properties: log_level: description: "smbdriver log level" default: "info" - log_time_format: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "rfc3339" disable: </pre>

Component	Version	Release Notes
		<pre>description: "disable smbdriver" default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.26.0...v3.27.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.26.0...v3.27.0</a> ## Resources - [Download release 3.27.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.27.0).</pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
staticfile-offline-buildpack	1.8.49	<p>▼ v1.8.49</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.38.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.38.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.29.0   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.29.x  </pre>
		<p>▼ v1.8.48</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.37.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.37.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4     nginx   1.29.0   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.8.47</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.36.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.36.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.8.46</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v</pre>

Component	Version	Release Notes
		<pre> 1.6.36.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.36.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x   </pre>
statsd-injector	1.11.48	
syslog	12.3.9	
system-metrics-scrapers	4.0.18	
uaa	77.20.7	<p>▼ v77.20.7</p> <pre> - Bump to [UAA v77.20.7] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.20.7">https://github.com/cloudfoundry/uaa/releases/tag/v77.20.7</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.20.6...v77.20.7">https://github.com/cloudfoundry/uaa-release/compare/v77.20.6...v77.20.7</a> </pre> <p>▼ v77.20.6</p> <pre> - Bump to [UAA v77.20.6] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.20.6">https://github.com/cloudfoundry/uaa/releases/tag/v77.20.6</a>) - Upgrade Tomcat to version 9.0.107 - Bump dependencies in Gemfile.lock - Bump go dependancies - Use Java 21; refactor packaging and prepa ckaging scripts to simplify - Bump rspec-core to version 3.13.5 - Bump bosh-utils, tlsconfig, and socks5-pr oxy dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.20.5...v77.20.6">https://github.com/cloudfoundry/uaa-release/compare/v77.20.5...v77.20.6</a> </pre>
tanzu-jammy-stack	1.0.1	

## 6.0.17

**Release Date:** 06/17/2025

- **[Bug Fix]** Autoscaling compare rules can set metric-tag filter
- Bump binary-offline-buildpack to version [1.1.49](#)
- Bump cf-autoscaling to version [250.5.4](#)

- Bump cf-cli to version 2.3.0
- Bump cflinuxfs3 to version 0.638.0
- Bump cflinuxfs4 to version 1.311.0
- Bump credhub to version 2.14.2
- Bump dotnet-core-offline-buildpack to version 2.4.70
- Bump garden-runc to version 1.72.0
- Bump go-offline-buildpack to version 1.10.68
- Bump java-offline-buildpack to version 4.84.0
- Bump mysql-monitoring to version 10.25.0
- Bump nats to version 56.48.0
- Bump nfs-volume to version 7.28.0
- Bump nginx-offline-buildpack to version 1.2.57
- Bump nodejs-offline-buildpack to version 1.8.68
- Bump notifications to version 80.0.0
- Bump notifications-ui to version 57.0.0
- Bump php-offline-buildpack to version 4.6.58
- Bump push-apps-manager-release to version 677.0.76
- Bump push-offline-docs-release to version 6.0.176
- Bump push-usage-service-release to version 674.0.171
- Bump pxc to version 1.0.41
- Bump python-offline-buildpack to version 1.8.65
- Bump r-offline-buildpack to version 1.2.51
- Bump routing to version 0.340.0
- Bump ruby-offline-buildpack to version 1.10.51
- Bump smb-volume to version 3.26.0
- Bump staticfile-offline-buildpack to version 1.8.45
- Bump uaa to version 77.20.5

## Security Fixes

Component	Vulnerabilities Resolved
binary-offline-buildpack	<ul style="list-style-type: none"> <li>• CVE-2025-22874 (high)</li> <li>• CVE-2025-4673 (medium)</li> <li>• CVE-2025-0913 (medium)</li> </ul>

Component	Vulnerabilities Resolved
cf-autoscaling	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-83qj-6fr2-vhqg</a> (critical)</li> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">GHSA-gh5c-3h97-2f3q</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">GHSA-73m2-qfq3-56cx</a> (high)</li> <li>• <a href="#">GHSA-rc42-6c7j-7h5r</a> (high)</li> <li>• <a href="#">GHSA-xw73-rw38-6vjc</a> (medium)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">GHSA-2mj3-vfvx-fc43</a> (medium)</li> <li>• <a href="#">GHSA-3p2h-wqq4-wf4h</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> <li>• <a href="#">GHSA-4wp7-92pw-q264</a> (low)</li> <li>• <a href="#">GHSA-h2fw-rfh5-95r3</a> (low)</li> <li>• <a href="#">GHSA-ff77-26x5-69cr</a> (low)</li> </ul>
cf-cli	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> </ul>
cflinuxfs3	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">CVE-2025-6069</a> (medium)</li> <li>• <a href="#">CVE-2025-22866</a> (medium)</li> </ul>
cflinuxfs4	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> </ul>

Component	Vulnerabilities Resolved
credhub	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-4wrc-f8pq-fpqp</a> (critical)</li> <li>• <a href="#">GHSA-cx7f-g6mp-7hqm</a> (high)</li> <li>• <a href="#">GHSA-g5vr-rgqm-vf78</a> (high)</li> <li>• <a href="#">GHSA-gvpg-vgmx-xg6w</a> (high)</li> <li>• <a href="#">GHSA-mg83-c7gq-rv5c</a> (high)</li> <li>• <a href="#">GHSA-rc42-6c7j-7h5r</a> (high)</li> <li>• <a href="#">GHSA-3p2h-wqq4-wf4h</a> (medium)</li> <li>• <a href="#">GHSA-4gc7-5j7h-4qph</a> (medium)</li> <li>• <a href="#">GHSA-w3c8-7r8f-9jp8</a> (medium)</li> <li>• <a href="#">GHSA-4wp7-92pw-q264</a> (low)</li> <li>• <a href="#">GHSA-ff77-26x5-69cr</a> (low)</li> <li>• <a href="#">GHSA-h2fw-rfh5-95r3</a> (low)</li> </ul>
java-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-21587</a> (high)</li> <li>• <a href="#">GHSA-3p2h-wqq4-wf4h</a> (medium)</li> <li>• <a href="#">CVE-2025-30698</a> (medium)</li> <li>• <a href="#">CVE-2025-30691</a> (medium)</li> </ul>
nats	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> </ul>
nginx-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> </ul>
nodejs-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-6069</a> (medium)</li> </ul>
notifications	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> </ul>
notifications-ui	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> </ul>
php-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-6069</a> (medium)</li> </ul>

Component	Vulnerabilities Resolved
push-apps-manager-release	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-c429-5p7v-vgjp</a> (high)</li> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">GHSA-jr5f-v2jv-69x6</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">GHSA-c7qv-q95q-8v27</a> (high)</li> <li>• <a href="#">GHSA-3xgq-45jj-v275</a> (high)</li> <li>• <a href="#">GHSA-9jgg-88mc-972h</a> (medium)</li> <li>• <a href="#">GHSA-4v9v-hfq4-rm2v</a> (medium)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> <li>• <a href="#">GHSA-4www-5p9h-95mh</a> (medium)</li> <li>• <a href="#">GHSA-9gqv-wp59-fq42</a> (medium)</li> <li>• <a href="#">GHSA-75v8-2h7p-7m2m</a> (low)</li> </ul>
push-offline-docs-release	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-mrxw-mxhj-p664</a> (high)</li> <li>• <a href="#">GHSA-6f62-3596-g6w7</a> (high)</li> <li>• <a href="#">GHSA-gjh7-p2fx-99vx</a> (high)</li> <li>• <a href="#">GHSA-7wqh-767x-r66v</a> (high)</li> <li>• <a href="#">GHSA-8cgq-6mh2-7j6v</a> (medium)</li> <li>• <a href="#">GHSA-7g2v-ji9q-g3rg</a> (medium)</li> <li>• <a href="#">GHSA-9hf4-67fc-4vf4</a> (medium)</li> <li>• <a href="#">GHSA-vvfq-8hwr-qm4m</a> (low)</li> <li>• <a href="#">GHSA-r95h-9x8f-r3f7</a> (low)</li> <li>• <a href="#">GHSA-5w6v-399v-w3cc</a> (low)</li> </ul>
push-usage-service-release	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">GHSA-mrxw-mxhj-p664</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">GHSA-gjh7-p2fx-99vx</a> (high)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> <li>• <a href="#">GHSA-9j94-67jr-4cqj</a> (medium)</li> <li>• <a href="#">GHSA-vvfq-8hwr-qm4m</a> (low)</li> <li>• <a href="#">GHSA-5w6v-399v-w3cc</a> (low)</li> </ul>
python-offline-buildpack	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22874</a> (high)</li> <li>• <a href="#">CVE-2025-4673</a> (medium)</li> <li>• <a href="#">CVE-2025-0913</a> (medium)</li> <li>• <a href="#">CVE-2025-6069</a> (medium)</li> </ul>

Component	Vulnerabilities Resolved
routing	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-53427</a> (high)</li> <li>• <a href="#">CVE-2025-48060</a> (high)</li> <li>• <a href="#">GHSA-4374-p667-p6c8</a> (high)</li> <li>• <a href="#">GHSA-2wrh-6pvc-2jm9</a> (medium)</li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a> (medium)</li> <li>• <a href="#">GHSA-qppj-fm5r-hxr3</a> (medium)</li> <li>• <a href="#">CVE-2024-23337</a> (medium)</li> </ul>
uaa	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-21587</a> (high)</li> <li>• <a href="#">GHSA-3p2h-wqq4-wf4h</a> (medium)</li> <li>• <a href="#">CVE-2025-30698</a> (medium)</li> <li>• <a href="#">GHSA-ff77-26x5-69cr</a> (low)</li> </ul>

## Component Versions

Component	Version	Release Notes
ubuntu-jammy stemcell	1.824	
backup-and-restore-sdk	1.19.45	

Component	Version	Release Notes
binary-offline-buildpack	1.1.49	<p>▼ v1.1.49</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 8.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 8.zip - binary_buildpack-cached-windows-v1.1.28.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.48</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 8.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 8.zip - binary_buildpack-cached-windows-v1.1.28.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.47</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 7.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 7.zip - binary_buildpack-cached-windows-v1.1.27.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.46</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 6.zip</pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- binary_buildpack-cached-cflinuxfs4-v1.1.26.zip</li> <li>- binary_buildpack-cached-windows-v1.1.26.zip</li> </ul> <pre>## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
	<b>▼ v1.1.45</b>	<p>Buildpacks provided by this bosh release:</p> <ul style="list-style-type: none"> <li>- binary_buildpack-cached-cflinuxfs3-v1.1.25.zip</li> <li>- binary_buildpack-cached-cflinuxfs4-v1.1.25.zip</li> <li>- binary_buildpack-cached-windows-v1.1.25.zip</li> </ul> <pre>## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
	<b>▼ v1.1.44</b>	<p>Buildpacks provided by this bosh release:</p> <ul style="list-style-type: none"> <li>- binary_buildpack-cached-cflinuxfs3-v1.1.24.zip</li> <li>- binary_buildpack-cached-cflinuxfs4-v1.1.24.zip</li> <li>- binary_buildpack-cached-windows-v1.1.24.zip</li> </ul> <pre>## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
	<b>▼ v1.1.43</b>	<p>Buildpacks provided by this bosh release:</p> <ul style="list-style-type: none"> <li>- binary_buildpack-cached-cflinuxfs3-v1.1.24.zip</li> <li>- binary_buildpack-cached-cflinuxfs4-v1.1.24.zip</li> <li>- binary_buildpack-cached-windows-v1.1.24.zip</li> </ul> <pre>## Packaged Binaries   Name   Version   CF Stacks  </pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
		<pre>  --- --- ---  ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.1.42</p> <pre> Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 4.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 4.zip - binary_buildpack-cached-windows-v1.1.24.z ip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
bosh-dns-aliases	0.0.4	
bpm	1.4.20	
capi	1.209.0	

Component	Version	Release Notes
cf-autoscaling	250.5.4	<p>▼ v250.5.4</p> <pre>## What's Changed Golang 1.24.3 -&gt; 1.24.4</pre> <p>▼ v250.5.3</p> <pre>## What's changed * Java dependency bumps * Spring boot bump required change to active profiles config; opting to remove the value for now as it appears unused * Go dependency bumps * jq 1.7.1 -&gt; 1.8.0</pre> <p>▼ v250.5.2</p> <pre>## What's Changed * Bug fix: autoscaler api now correctly allows users to set the metric-filter on compare rules</pre> <p>▼ v250.5.1</p> <pre>## What's Changed * Bump vendored Go version to 1.24 * Bump CF CLI go module to latest commit instead of outdated go package version * Update Go version used in CI to build plugin binaries to 1.24</pre> <p>▼ v250.5.0</p> <pre>## What's Changed * New Feature: User may specify tag filters on the metrics used in custom and comparison autoscaling rules * #28, #31, #32 * Bump Golang: `1.23.7` -&gt; `1.23.9` * Bump Golang dependencies * Bump JDK: OpenJDK17U `17.0.14_7` -&gt; `17.0.15_6` * Bump java dependencies ## Disclaimer This release was produced manually in lieu of using the existing Concourse automation due to infrastructure instability during time leading up to code freeze. Validation was completed manually with a TAS 10 lite environment and subsequently with the normal concourse</pre>

Component	Version	Release Notes
		fan out when infrastructure re-stabilized.
cf-cli	2.3.0	<p>▼ v2.3.0</p> <pre>### Included CF CLI versions: 8.14.1</pre> <p>▼ v2.2.0</p> <pre>### Included CF CLI versions: 8.14.0</pre>
cf-networking	3.70.0	
cflinuxfs3	0.638.0	
cflinuxfs4	1.311.0	
count-cores-indicator	2.0.0	

Component	Version	Release Notes
credhub	2.14.2	<p>▼ 2.14.2</p> <pre>## What's Changed * Replaced many deprecated Java API calls by @hsinn0, @peterhaochen47. * Bumped Java major version from 17 to 21. * Done other various dependency bumps. **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.14.1...2.14.2">https://github.com/pivotal/credhub-release/compare/2.14.1...2.14.2</a></pre> <p>▼ 2.14.1</p> <pre>## What's Changed * Build(deps): Bump rubocop from 1.75.5 to 1.75.7 in /spec by @dependabot in <a href="https://github.com/pivotal/credhub-release/pull/330">https://github.com/pivotal/credhub-release/pull/330</a> * Various dependency bumps &amp; organization, and code refactors (replacing deprecated lib usages) after the bump to Spring Boot 3 in 2.14.0 **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.14.0...2.14.1">https://github.com/pivotal/credhub-release/compare/2.14.0...2.14.1</a></pre> <p>▼ 2.14.0</p> <pre>## What's Changed - Spring Boot major version upgrade to 3 in <a href="https://github.com/cloudfoundry/credhub/pull/900">https://github.com/cloudfoundry/credhub/pull/900</a> by @hsinn0, @joeeltgroth and @peterhaochen47 - Other various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.13.3...2.14.0">https://github.com/pivotal/credhub-release/compare/2.13.3...2.14.0</a></pre>
diego	2.117.0	

Component	Version	Release Notes
dotnet-core-offline-buildpack	2.4.70	<p>▼ v2.4.70</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.49.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.49.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinu xfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinu xfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4     libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> <p>▼ v2.4.69</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.49.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.49.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinu xfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinu xfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4 </pre>

Component	Version	Release Notes
		<pre>   libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre>

#### ▼ v2.4.68

```

Buildpacks provided by this bosh release:
- dotnet-core_buildpack-cached-cflinuxfs3-v
2.4.48.zip
- dotnet-core_buildpack-cached-cflinuxfs4-v
2.4.48.zip
## Packaged Binaries
| Name | Version | CF Stacks |
|---|---|---|
| libgdiplus | 6.1 | cflinuxfs3, cflinuxfs4
|
| libunwind | 1.8.1 | cflinuxfs3, cflinuxfs
4 |
| node | 20.16.0 | cflinuxfs3 |
| node | 22.14.0 | cflinuxfs4 |
| bower | 1.8.14 | cflinuxfs4, cflinuxfs3 |
| dotnet-aspnetcore | 8.0.15 | cflinuxfs4,
cflinuxfs3 |
| dotnet-aspnetcore | 9.0.4 | cflinuxfs4, c
flinuxfs3 |
| dotnet-runtime | 8.0.15 | cflinuxfs4, cfl
inuxfs3 |
| dotnet-runtime | 9.0.4 | cflinuxfs4, cfl
inuxfs3 |
| dotnet-sdk | 8.0.408 | cflinuxfs4, cflinu
xfs3 |
| dotnet-sdk | 9.0.203 | cflinuxfs4, cflinu
xfs3 |
## Default Versions
| Name | Version |
|---|---|
| dotnet-runtime | 8.0.x |
| dotnet-aspnetcore | 8.0.x |
| dotnet-sdk | 8.0.x |
| bower | 1.8.x |

```

Component	Version	Release Notes
		<p>▼ v2.4.67</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.47.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.47.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinu xfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinu xfs3     libgdplus   6.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre>
		<p>▼ v2.4.66</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.46.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.46.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3   </pre>

Component	Version	Release Notes
		<pre>   dotnet-sdk   8.0.408   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4       libunwind   1.8.1   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre>

#### ▼ v2.4.65

```

Buildpacks provided by this bosh release:
- dotnet-core_buildpack-cached-cflinuxfs3-v2.4.46.zip
- dotnet-core_buildpack-cached-cflinuxfs4-v2.4.46.zip
## Packaged Binaries
| Name | Version | CF Stacks |
|---|---|---|
| bower | 1.8.14 | cflinuxfs4, cflinuxfs3 |
| dotnet-aspnetcore | 8.0.15 | cflinuxfs4, cflinuxfs3 |
| dotnet-aspnetcore | 9.0.4 | cflinuxfs4, cflinuxfs3 |
| dotnet-runtime | 8.0.15 | cflinuxfs4, cflinuxfs3 |
| dotnet-runtime | 9.0.4 | cflinuxfs4, cflinuxfs3 |
| dotnet-sdk | 8.0.408 | cflinuxfs4, cflinuxfs3 |
| dotnet-sdk | 9.0.203 | cflinuxfs4, cflinuxfs3 |
| libgdiplus | 6.1 | cflinuxfs3, cflinuxfs4 |
|
| libunwind | 1.8.1 | cflinuxfs3, cflinuxfs4 |
| node | 20.16.0 | cflinuxfs3 |
| node | 22.14.0 | cflinuxfs4 |
## Default Versions
| Name | Version |
|---|---|
| dotnet-runtime | 8.0.x |
| dotnet-aspnetcore | 8.0.x |
| dotnet-sdk | 8.0.x |
| bower | 1.8.x |

```

Component	Version	Release Notes
		<p>▼ v2.4.64</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.46.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.46.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinu xfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinu xfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4     libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre>
garden-runc	1.72.0	<p>▼ v1.72.0</p> <pre> ## 1.72.0 **Release Date**: May 16, 2025 ## Changes - Update dependencies ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.71.0...v1.72.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.71.0...v1.72.0</a> ## Resources - [Download release 1.72.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.72.0). </pre>

Component	Version	Release Notes
go-offline-buildpack	1.10.68	<p>▼ v1.10.68</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.44.zip - go_buildpack-cached-cflinuxfs4-v1.10.44.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4    ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
		<p>▼ v1.10.67</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.44.zip - go_buildpack-cached-cflinuxfs4-v1.10.44.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4    ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
		<p>▼ v1.10.66</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.43.zip - go_buildpack-cached-cflinuxfs4-v1.10.43.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4  </pre>

Component	Version	Release Notes
		<pre>  godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
	<b>▼ v1.10.65</b>	<pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.42.zip - go_buildpack-cached-cflinuxfs4-v1.10.42.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
	<b>▼ v1.10.64</b>	<pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.41.zip - go_buildpack-cached-cflinuxfs4-v1.10.41.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre>
	<b>▼ v1.10.63</b>	<pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.41.zip - go_buildpack-cached-cflinuxfs4-v1.10.41.zip  ## Packaged Binaries</pre>

Component	Version	Release Notes
		<pre>   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x   </pre> <p>▼ v1.10.62</p> <pre> Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.41.zip - go_buildpack-cached-cflinuxfs4-v1.10.41.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x   </pre>

Component	Version	Release Notes
java-offline-buildpack	4.84.0	<p>▼ v4.84.0</p> <pre> Buildpacks provided by this bosh release: - java-buildpack-offline-cflinuxfs3-v4.82.0.zip - java-buildpack-offline-cflinuxfs4-v4.82.0.zip  I'm pleased to announce the release of the `java-buildpack`, version `4.82.0`.  This release includes dependency updates, including for Tomcat 9 &amp; 10.1 and the latest Java patch releases.    Dependency   Version   CVEs   Release Notes     -----   -----   -----   -----   --     AppDynamics Agent   `25.2.0_36823`     [Release Notes] (<a href="https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes">https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes</a>)     Azure Application Insights Agent   `3.7.2`     [Release Notes] (<a href="https://github.com/Microsoft/ApplicationInsights-Java/releases">https://github.com/Microsoft/ApplicationInsights-Java/releases</a>)     CA Introscope APM Framework   `25.5.1_11`         Client Certificate Mapper   `2.0.1`   Included inline above     Container Security Provider   `1.20.0_REL_EASE`   Included inline above     Contrast Security Agent   `6.16.0`     [Release Notes] (<a href="https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html">https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html</a>)     Datadog APM Javaagent   `1.49.0`     [Release Notes] (<a href="https://github.com/DataDog/dd-trace-java/releases">https://github.com/DataDog/dd-trace-java/releases</a>)     Elastic APM Agent   `1.53.0`     [Release Notes] (<a href="https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html</a>)     Gemalto Luna Security Provider   `7.4.0`     [Release Notes] (<a href="https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm">https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm</a>)     Geode Tomcat Session Store   `2.0.3`       Google Stackdriver Profiler   `0.1.0`     [Release Notes] (<a href="https://cloud.google.com/profiler/docs/release-notes">https://cloud.google.com/profiler/docs/release-notes</a>)     Groovy   `2.5.23`     [Release Notes] (<a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a>)     JaCoCo Agent   `0.8.13`     [Release Notes] (<a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a>)       Java CFEnv   `3.4.0`     [Release Notes] (<a href="https://github.com/pivotal-cf/java-cfenv/releases">https://github.com/pivotal-cf/java-cfenv/releases</a>)   </pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>  Java Memory Assistant Agent   `0.5.0`    </li> <li>   </li> <li>  Java Memory Assistant Clean Up   `0.1.0`</li> <li>     </li> <li>  JProfiler Profiler   `13.0.7`     [Change Log] (<a href="https://www.ej-technologies.com/downloads/jprofiler/changelog.html">https://www.ej-technologies.com/downloads/jprofiler/changelog.html</a>)  </li> <li>  JRebel Agent   `2025.2.1`     [ChangeLog] (<a href="https://www.jrebel.com/products/jrebel/changelog">https://www.jrebel.com/products/jrebel/changelog</a>)  </li> <li>  jvckill Agent   `1.17.0_RELEASE`   Included inline above   Included inline above  </li> <li>  MariaDB JDBC Driver   `2.7.9`     [Release Notes] (<a href="https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/">https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/</a>)  </li> <li>  Memory Calculator   `3.13.0_RELEASE`   Included inline above   Included inline above  </li> <li>  Metric Writer   `3.5.0_RELEASE`   Included inline above   Included inline above  </li> <li>  New Relic Agent   `8.20.0`     [Release Notes] (<a href="https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/">https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/</a>)  </li> <li>  Open Telemetry Agent   `2.15.0`     [Release Notes] (<a href="https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases">https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases</a>)  </li> <li>   </li> <li>  OpenJDK JRE 11   `11.0.27_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/</a>)  </li> <li>  OpenJDK JRE 17   `17.0.15_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/</a>)  </li> <li>  OpenJDK JRE 21   `21.0.7_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/</a>)  </li> <li>  OpenJDK JRE 8   `1.8.0_452`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/</a>)  </li> <li>  PostgreSQL JDBC Driver   `42.7.5`     [ChangeLog] (<a href="https://jdbc.postgresql.org/documentation/changelog.html">https://jdbc.postgresql.org/documentation/changelog.html</a>)  </li> <li>  Redis Session Store   `1.3.6_RELEASE`   Included inline above   Included inline above  </li> <li>  Riverbed Appinternals Agent   `11.8.5_BL527`      </li> <li>  SeaLights Agent   `4.0.2570`      </li> <li>  SkyWalking   `9.4.0`     [ChangeLog] (<a href="https://github.com/apache/skywalking/tree/master/">https://github.com/apache/skywalking/tree/master/</a>)  </li> </ul>

Component	Version	Release Notes
		<pre> changes)       Splunk OpenTelemetry Java Agent   `2.10.0 `     [Release Notes] (<a href="https://github.com/signalfx/splunk-otel-java/releases">https://github.com/signalfx/splunk-otel-java/releases</a>)       Spring Auto-reconfiguration   `2.12.0_RELEASE`   Included inline above   Included inline above       Spring Boot CLI   `2.7.18`           Spring Boot Container Customizer   `2.6.0_RELEASE`   Included inline above   Included inline above       Spring Kit CLI   `0.4.0`           Takipi Agent   `4.73.3`     [Release Notes] (<a href="https://doc.overops.com/docs/whats-new">https://doc.overops.com/docs/whats-new</a>)       Tomcat 10.1   `10.1.41`   [Security] (<a href="https://tomcat.apache.org/security-10.html">https://tomcat.apache.org/security-10.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-10.1-doc/changelog.html">https://tomcat.apache.org/tomcat-10.1-doc/changelog.html</a>)       Tomcat 9   `9.0.105`   [Security] (<a href="https://tomcat.apache.org/security-9.html">https://tomcat.apache.org/security-9.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-9.0-doc/changelog.html">https://tomcat.apache.org/tomcat-9.0-doc/changelog.html</a>)       Tomcat Access Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above       Tomcat Lifecycle Support   `3.4.0_RELEASE`   Included inline above   Included inline above       Tomcat Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above       YourKit Profiler   `2025.3.135`     [Release Notes] (<a href="https://www.yourkit.com/download/yjp_2024_9_builds.jsp">https://www.yourkit.com/download/yjp_2024_9_builds.jsp</a>)   </pre>
java-native-image-cnb-buildpack	0.11.22	
log-cache	3.2.0	
loggregator	107.0.21	
loggregator-agent	8.3.8	
metric-registrar	4.0.8	
mysql-monitoring	10.25.0	<p>▼ v10.25.0</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">           Dependency bumps.         </div> <p>▼ v10.24.0</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">           Dependency bumps           <ul style="list-style-type: none"> <li>* Bump Go to v1.24.3</li> </ul> </div>

Component	Version	Release Notes
nats	56.48.0	<p>▼ v56.48.0</p> <pre> ## 56.48.0 **Release Date**: June 09, 2025 ## Changes - Bumped to golang 1.24.4 - Dependency bumps ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.47.0...v56.48.0">https://github.com/cloudfoundry/nats-release/compare/v56.47.0...v56.48.0</a> ## Resources - [Download release 56.48.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.48.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.48.0</a>).</pre> <p>▼ v56.47.0</p> <pre> ## 56.47.0 **Release Date**: June 06, 2025 ## Changes - Bump dependencies ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.46.0...v56.47.0">https://github.com/cloudfoundry/nats-release/compare/v56.46.0...v56.47.0</a> ## Resources - [Download release 56.47.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.47.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.47.0</a>).</pre>
nfs-volume	7.28.0	<p>▼ v7.28.0</p> <pre> ## 7.28.0 **Release Date**: May 16, 2025 ## Changes - Bump dependencies - Bump to golang 1.24.3 ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.27.0...v7.28.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.27.0...v7.28.0</a> ## Resources - [Download release 7.28.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.28.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.28.0</a>).</pre>

Component	Version	Release Notes
nginx-offline-buildpack	1.2.57	<p>▼ v1.2.57</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 7.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.2.56</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 7.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.2.55</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 6.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 6.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4  </pre>

Component	Version	Release Notes																			
		<pre>   openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x   </pre>																			
	<b>▼ v1.2.54</b>	<p>Buildpacks provided by this bosh release:</p> <ul style="list-style-type: none"> <li>- nginx_buildpack-cached-cflinuxfs3-v1.2.3.5.zip</li> <li>- nginx_buildpack-cached-cflinuxfs4-v1.2.3.5.zip</li> </ul> <p>## Packaged Binaries</p> <table border="1"> <thead> <tr> <th>Name</th><th>Version</th><th>CF Stacks</th></tr> </thead> <tbody> <tr> <td>nginx</td><td>1.26.3</td><td>cflinuxfs3, cflinuxfs4</td></tr> <tr> <td>nginx</td><td>1.27.4</td><td>cflinuxfs3, cflinuxfs4</td></tr> <tr> <td>openresty</td><td>1.21.4.3</td><td>cflinuxfs3, cflinuxfs4</td></tr> <tr> <td>openresty</td><td>1.25.3.2</td><td>cflinuxfs3, cflinuxfs4</td></tr> </tbody> </table> <p>## Default Versions</p> <table border="1"> <thead> <tr> <th>Name</th><th>Version</th></tr> </thead> <tbody> <tr> <td>nginx</td><td>1.27.x</td></tr> </tbody> </table>	Name	Version	CF Stacks	nginx	1.26.3	cflinuxfs3, cflinuxfs4	nginx	1.27.4	cflinuxfs3, cflinuxfs4	openresty	1.21.4.3	cflinuxfs3, cflinuxfs4	openresty	1.25.3.2	cflinuxfs3, cflinuxfs4	Name	Version	nginx	1.27.x
Name	Version	CF Stacks																			
nginx	1.26.3	cflinuxfs3, cflinuxfs4																			
nginx	1.27.4	cflinuxfs3, cflinuxfs4																			
openresty	1.21.4.3	cflinuxfs3, cflinuxfs4																			
openresty	1.25.3.2	cflinuxfs3, cflinuxfs4																			
Name	Version																				
nginx	1.27.x																				
	<b>▼ v1.2.53</b>	<p>Buildpacks provided by this bosh release:</p> <ul style="list-style-type: none"> <li>- nginx_buildpack-cached-cflinuxfs3-v1.2.3.4.zip</li> <li>- nginx_buildpack-cached-cflinuxfs4-v1.2.3.4.zip</li> </ul> <p>## Packaged Binaries</p> <table border="1"> <thead> <tr> <th>Name</th><th>Version</th><th>CF Stacks</th></tr> </thead> <tbody> <tr> <td>nginx</td><td>1.26.3</td><td>cflinuxfs3, cflinuxfs4</td></tr> <tr> <td>nginx</td><td>1.27.4</td><td>cflinuxfs3, cflinuxfs4</td></tr> <tr> <td>openresty</td><td>1.21.4.3</td><td>cflinuxfs3, cflinuxfs4</td></tr> <tr> <td>openresty</td><td>1.25.3.2</td><td>cflinuxfs3, cflinuxfs4</td></tr> </tbody> </table> <p>## Default Versions</p> <table border="1"> <thead> <tr> <th>Name</th><th>Version</th></tr> </thead> <tbody> <tr> <td>nginx</td><td>1.27.x</td></tr> </tbody> </table>	Name	Version	CF Stacks	nginx	1.26.3	cflinuxfs3, cflinuxfs4	nginx	1.27.4	cflinuxfs3, cflinuxfs4	openresty	1.21.4.3	cflinuxfs3, cflinuxfs4	openresty	1.25.3.2	cflinuxfs3, cflinuxfs4	Name	Version	nginx	1.27.x
Name	Version	CF Stacks																			
nginx	1.26.3	cflinuxfs3, cflinuxfs4																			
nginx	1.27.4	cflinuxfs3, cflinuxfs4																			
openresty	1.21.4.3	cflinuxfs3, cflinuxfs4																			
openresty	1.25.3.2	cflinuxfs3, cflinuxfs4																			
Name	Version																				
nginx	1.27.x																				

Component	Version	Release Notes
		<pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 3.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 3.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x   </pre>
		<p>▼ v1.2.51</p> <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 3.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 3.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x   </pre>
		<p>▼ v1.2.50</p> <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 3.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 3.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   </pre>

Component	Version	Release Notes
		<pre>xfs4   ## Default Versions   Name   Version     ---   ---     nginx   1.27.x  </pre>

Component	Version	Release Notes
nodejs-offline-buildpack	1.8.68	<p>▼ v1.8.68</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 6.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 6.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.15.1   cflinuxfs4     node   22.16.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre>
		<p>▼ v1.8.67</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 6.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 6.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.15.1   cflinuxfs4     node   22.16.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre>
		<p>▼ v1.8.66</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 </pre>

Component	Version	Release Notes
		<pre> 5.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4  5.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.15.0   cflinuxfs4     node   22.15.1   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre> <p>▼ v1.8.65</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4  4.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4  4.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre> <p>▼ v1.8.64</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4  4.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4  4.zip ## Packaged Binaries   Name   Version   CF Stacks   </pre>

Component	Version	Release Notes
		<pre>  --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre> <p>▼ v1.8.63</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 4.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 4.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre>
notifications	80.0.0	<p>▼ v80.0.0</p> <pre> * update jq * bump-golang to go 1.24.3 </pre>
notifications-ui	57.0.0	<p>▼ v57.0.0</p> <pre> * update dependencies </pre>

Component	Version	Release Notes
otel-collector	0.11.4	

Component	Version	Release Notes
php-offline-buildpack	4.6.58	<p>▼ v4.6.58</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.35.zip - php_buildpack-cached-cflinuxfs4-v4.6.35.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.12.4   cflinuxfs3, cflinuxfs4     ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8   </pre> <p>▼ v4.6.57</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.35.zip - php_buildpack-cached-cflinuxfs4-v4.6.35.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    python   3.12.4   cflinuxfs3, cflinuxfs4     ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre> uxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8   </pre> <p>▼ v4.6.56</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.34.zip - php_buildpack-cached-cflinuxfs4-v4.6.34.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8   </pre>

Component	Version	Release Notes
		<p>▼ v4.6.55</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.33.zip - php_buildpack-cached-cflinuxfs4-v4.6.33.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3     ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8   </pre>
		<p>▼ v4.6.54</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.32.zip - php_buildpack-cached-cflinuxfs4-v4.6.32.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre>   appdynamics   23.11.0-839   cflinuxfs4, c   flinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3     httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cfli uxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.5     composer   2.8.8   </pre> <p>▼ v4.6.53</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.31.z ip - php_buildpack-cached-cflinuxfs4-v4.6.31.z ip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4     ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, c flinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3     httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cfli uxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre>

Component	Version	Release Notes
		<p>▼ v4.6.52</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.31.zip - php_buildpack-cached-cflinuxfs4-v4.6.31.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre>
		<p>▼ v4.6.51</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.31.zip - php_buildpack-cached-cflinuxfs4-v4.6.31.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre>   ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre>
push-apps-manager-release	677.0.76	<p>▼ 677.0.76</p> <ul style="list-style-type: none"> <li>* update dependencies</li> </ul> <p>▼ 677.0.75</p> <ul style="list-style-type: none"> <li>* update dependencies</li> </ul> <p>▼ 677.0.74</p> <ul style="list-style-type: none"> <li>## What's Changed</li> <li>* update dependencies</li> </ul> <p>▼ 677.0.73</p> <ul style="list-style-type: none"> <li>* update dependencies</li> </ul> <p>▼ 677.0.72</p> <ul style="list-style-type: none"> <li>* don't delete user tokens unless the bad response comes from uaa or capi</li> <li>* add additional possible source for sourcing cf cli</li> <li>* update dependencies</li> </ul>
push-offline-docs-release	6.0.176	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
push-usage-service-release	674.0.171	<p>▼ v674.0.171</p> <pre>## Changes * creating final release 674.0.170</pre> <p>▼ v674.0.170</p> <pre>## Changes * Update Nokogiri package to fix TASCVE-8866 9 (#38) * creating final release 674.0.169</pre> <p>▼ v674.0.169</p> <pre>## Changes * CVE fix for package jq from 1.7.1 to 1.8. 0 * Fix incorrect Max Concurrent report value</pre> <p>▼ v674.0.168</p> <pre>## Changes * chore: allow simultaneous PRs for CI * creating final release 674.0.167 * fix jq to use a access token for releases not a ssh_key</pre> <p>▼ v674.0.167</p> <pre>## Changes * Remove remnants of metrics-registrar-cli (#34) * TNZ-42842 - Fix for CVE-2025-46336 and CV E-2025-46727 (#35) * creating final release 674.0.165</pre>

Component	Version	Release Notes
pxc	1.0.41	<p>▼ v1.0.41</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## Release Notes **Dependency bumps** - Updates packages and dependencies</pre></div> <p>▼ v1.0.40</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## Release Notes **Dependency bumps** - pxc-release components now build with [Go v1.24.3] (<a href="https://go.dev/doc/devel/release#go.1.24.minor">https://go.dev/doc/devel/release#go.1.24.minor</a>) - Updates packages and dependencies</pre></div>

Component	Version	Release Notes
python-offline-buildpack	1.8.65	<p>▼ v1.8.65</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 9.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 9.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    setuptools   80.9.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.23   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre> <p>▼ v1.8.64</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 9.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 9.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    setuptools   80.9.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.23   cflinuxfs3, cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre>       python   3.10.17   cflinuxfs3, cflinuxfs4       python   3.11.12   cflinuxfs3, cflinuxfs4       python   3.12.10   cflinuxfs3, cflinuxfs4       python   3.13.3   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre>
	▼ v1.8.63	<pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 8.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    setuptools   80.9.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.22   cflinuxfs3, cflinuxfs4       python   3.10.17   cflinuxfs3, cflinuxfs4       python   3.11.12   cflinuxfs3, cflinuxfs4       python   3.12.10   cflinuxfs3, cflinuxfs4       python   3.13.3   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre>
	▼ v1.8.62	<pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 7.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 </pre>

Component	Version	Release Notes
		<pre> 7.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    setuptools   80.8.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre> <p>▼ v1.8.61</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 6.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 6.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre>   setuptools   80.7.1   cflinuxfs4, cflinux   fs3   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre>
	▼ v1.8.60	<pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 5.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 5.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    miniforge   24.7.1   cflinuxfs4, cflinuxfs   s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs   4     python   3.9.22   cflinuxfs3, cflinuxfs4         python   3.10.17   cflinuxfs3, cflinuxfs4         python   3.11.12   cflinuxfs3, cflinuxfs4         python   3.12.10   cflinuxfs3, cflinuxfs4         python   3.13.3   cflinuxfs3, cflinuxfs4         setuptools   80.4.0   cflinuxfs4, cflinux   fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu   xfs3   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre>
	▼ v1.8.59	<pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 5.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 5.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    miniforge   24.7.1   cflinuxfs4, cflinuxfs   s3     pip   25.0.1   cflinuxfs4, cflinuxfs3   </pre>

Component	Version	Release Notes
		<pre>   pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     setuptools   80.4.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre> <p>▼ v1.8.58</p> <pre> Buildpacks provided by this bash release: - python_buildpack-cached-cflinuxfs3-v1.8.4 5.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 5.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     setuptools   80.4.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3   ## Default Versions   Name   Version    --- ---  </pre>

Component	Version	Release Notes
		python   3.10.x

Component	Version	Release Notes
r-offline-buildpack	1.2.51	<p>▼ v1.2.51</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.28.zip - r_buildpack-cached-cflinuxfs4-v1.2.28.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.2.50</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.28.zip - r_buildpack-cached-cflinuxfs4-v1.2.28.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.2.49</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.27.zip - r_buildpack-cached-cflinuxfs4-v1.2.27.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.2.48</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.26.zip - r_buildpack-cached-cflinuxfs4-v1.2.26.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- --- </pre>

Component	Version	Release Notes
		<pre>  r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.2.47</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.25.zip - r_buildpack-cached-cflinuxfs4-v1.2.25.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.2.46</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.25.zip - r_buildpack-cached-cflinuxfs4-v1.2.25.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.2.45</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.25.zip - r_buildpack-cached-cflinuxfs4-v1.2.25.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre>

Component	Version	Release Notes
routing	0.340.0	<p>▼ v0.340.0</p> <pre> ## 0.340.0 **Release Date**: June 06, 2025 ## Changes - Bumped to golang 1.24.4 - Bumped to jq 1.8.0 ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index a88b19ab..8378da13 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -255,6 +255,10 @@ properties: Maximum number of attempts on failing requests against route service URLs. The minimum value for this setting is 1. This prevents gorouter from getting blocked by indefinite retries. default: 3 + router.route_services.enable_websockets: +   description:   +     Enable websocket connections for application routes bound to Route Services. +   default: true router.route_services.cert_chain: description: Certificate chain used for client authentication to TLS-registered route services. In PEM format. router.route_services.private_key: ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.339.0...v0.340.0">https://github.com/cloudfoundry/routing-release/compare/v0.339.0...v0.340.0</a> ## Resources - [Download release 0.340.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.340.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.340.0</a>). </pre> <p>▼ v0.339.0</p> <pre> ## 0.339.0 **Release Date**: June 04, 2025 ## Changes - feat: RouteAdded and RouteDeleted metrics have been introduced - <a href="https://github.com/cloudfoundry/routing-release/pull/478/commits/a3c548753844a3519c3e5e1a18f08b9f7219d776">https://github.com/cloudfoundry/routing-release/pull/478/commits/a3c548753844a3519c3e5e1a18f08b9f7219d776</a>. Thanks @Soha-Albaghdady / @maxmoehl - feat: websockets are now supported via route services by default and can be disabled via: `router.route_services.enable_websockets: false`. <a href="https://github.com/cloudfoundry/routing-release/pull/474">https://github.com/cloudfoundry/routing-release/pull/474</a>. Thanks @Dariquest / @max </pre>

Component	Version	Release Notes
		<pre> moehl   - refactor: 100-continue specific proxy has     been removed, golang 1.23 handles it correctly   - https://github.com/cloudfoundry/routing-release/pull/483. Thanks @geofffranks   - refactor: route registry metrics have been     fixed to report correct result https://github.com/cloudfoundry/routing-release/issues/468     and https://github.com/cloudfoundry/routing-release/pull/478. Thanks @maxmoehl / @hoffmann   - ci: PR validation has been introduced to     run linters and unit/integration tests. Trigger PR validation via label `ready-to-run`. Thanks @kart2bc   - misc: pre-start checks below were merged     prior to 0.338.0 via https://github.com/cloudfoundry/routing-release/pull/481. They are kept for reference and were missed during CI migrations     ## Bosh Job Spec changes:     ````diff     diff --git a/jobs/tcp_router/spec b/jobs/tcp_router/spec     index aa6b764c..234e3db9 100644     --- a/jobs/tcp_router/spec     +++ b/jobs/tcp_router/spec     @@ -19,6 +19,7 @@       templates:         haproxy.conf.template.erb: config/haproxy.conf.template         bpm.yml.erb: config/bpm.yml         drain.erb: bin/drain         + pre-start.erb: bin/pre-start         post-start.erb: bin/post-start         packages:         ```      ## Built with go 1.24.3     **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.338.0...v0.339.0     ## Resources     - [Download release 0.339.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.339.0). </pre> <p>▼ v0.338.0</p> <pre> ## 0.338.0 **Release Date**: May 16, 2025 ## Changes - Update dependencies ## Built with go 1.24.3 **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.337.0...v0.338.0 ## Resources - [Download release 0.338.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.338.0). </pre>

Component	Version	Release Notes
		<p><a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.338.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.338.0</a>.</p>

Component	Version	Release Notes
ruby-offline-buildpack	1.10.51	<p>▼ v1.10.51</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.3 1.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.3 1.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3       jruby   9.4.8.0   cflinuxfs3, cflinuxfs4       node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.2.8   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     ruby   3.3.8   cflinuxfs3, cflinuxfs4     ruby   3.4.2   cflinuxfs3, cflinuxfs4     ruby   3.4.4   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre> <p>▼ v1.10.50</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.3 1.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.3 1.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3       jruby   9.4.8.0   cflinuxfs3, cflinuxfs4       node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4   </pre>

Component	Version	Release Notes
		<pre>   ruby   3.2.8   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     ruby   3.3.8   cflinuxfs3, cflinuxfs4     ruby   3.4.2   cflinuxfs3, cflinuxfs4     ruby   3.4.4   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre> <p>▼ v1.10.49</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.3 0.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.3 0.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    bundler   2.6.8   cflinuxfs4, cflinuxfs3     jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.2.8   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     ruby   3.3.8   cflinuxfs3, cflinuxfs4     ruby   3.4.2   cflinuxfs3, cflinuxfs4     ruby   3.4.4   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre> <p>▼ v1.10.48</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 9.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 9.zip ## Packaged Binaries   Name   Version   CF Stacks   </pre>

Component	Version	Release Notes
		<pre>  --- --- ---    openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     ruby   3.4.2   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3     jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre>
	v1.10.47	<pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 8.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre>

Component	Version	Release Notes
		<p>▼ v1.10.46</p> <pre>Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 8.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x  </pre>
		<p>▼ v1.10.45</p> <pre>Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 8.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3  </pre>

Component	Version	Release Notes
		<pre>  yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x  </pre>
web-servers-cnb-buildpack	0.15.2	
silk	3.70.0	
smb-volume	3.26.0	<p>▼ v3.26.0</p> <pre>## 3.26.0 **Release Date**: May 16, 2025 ## Changes - Bumped dependencies - Bumped golang to 1.24.3 ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.25.0...v3.26.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.25.0...v3.26.0</a> ## Resources - [Download release 3.26.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.26.0).</pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
staticfile-offline-buildpack	1.8.45	<p>▼ v1.8.45</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.36.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.36.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.8.44</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.36.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.36.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.8.43</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.35.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.35.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
		<p>▼ v1.8.42</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.34.zip</pre>

Component	Version	Release Notes
		<pre>- staticfile_buildpack-cached-cflinuxfs4-v 1.6.34.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
	<b>▼ v1.8.41</b>	<pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.33.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.33.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
	<b>▼ v1.8.40</b>	<pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.33.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.33.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre>
	<b>▼ v1.8.39</b>	<pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.33.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.33.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4  </pre>

Component	Version	Release Notes
		<pre>## Default Versions   Name   Version     ---   ---     nginx   1.27.x  </pre>
statsd-injector	1.11.48	
syslog	12.3.9	
system-metrics-scraper	4.0.18	
uaa	77.20.5	<p>▼ v77.20.5</p> <pre>### New UAA * Bump to [UAA v77.20.5] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.20.5">https://github.com/cloudfoundry/uaa/releases/tag/v77.20.5</a>)   * [Upgrade Tomcat to version 9.0.104] (<a href="https://github.com/cloudfoundry/uaa-release/commit/0e841d009b621b98f23ba1c698b4e3934f1ec7af">https://github.com/cloudfoundry/uaa-release/commit/0e841d009b621b98f23ba1c698b4e3934f1ec7af</a>)   * [Upgrade Bellsoft JDK to version 17.0.15+10] (<a href="https://github.com/cloudfoundry/uaa-release/commit/ba7acbd3a7b7ed029e02ee08e62d3ced76e55c05">https://github.com/cloudfoundry/uaa-release/commit/ba7acbd3a7b7ed029e02ee08e62d3ced76e55c05</a>) ### Dependency Bumps * Bump activesupport from 8.0.1 to 8.0.2 * Bump golang.org/x/net from 0.35.0 to 0.38.0 in /src/acceptance_tests * Bump github.com/cloudfoundry/bosh-utils in /src/acceptance_tests * Bump minitest from 5.25.4 to 5.25.5 * Bump nokogiri from 1.18.3 to 1.18.8 * Bump github.com/onsi/gomega in /src/acceptance_tests * Bump github.com/cloudfoundry/bosh-utils in /src/acceptance_tests * Bump logger from 1.6.6 to 1.7.0 * Bump byebug from 11.1.3 to 12.0.0 * Bump pry from 0.14.2 to 0.15.2 * Bump rspec-mocks from 3.13.2 to 3.13.3 * Bump rspec-expectations from 3.13.2 to 3.13.4 * Bump connection_pool from 2.5.0 to 2.5.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.20.4...v77.20.5">https://github.com/cloudfoundry/uaa-release/compare/v77.20.4...v77.20.5</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.16



**Known Issue:** cf-networking-release versions 3.67.0 - 3.70.0 contain a bug that breaks pagination for listing and removing container-to-container (c2c) network policies when the

user has more than 100 roles, as is often the case for users involved in automated provisioning. This bug only affects listing and removing network policies and not enforcing those policies. This bug also does not affect Application Security Groups. For more information, see this [Knowledge Base article](#).

**Affected versions:** 6.0.14, 6.0.15, 6.0.16, 6.0.17

**Release Date:** 05/15/2025

- **[Feature]** Add property to control UAA disableInResponseToCheck
- **[Feature Improvement]** Make Dynamic ASG sync interval properties configurable in the “Networking” tab. These properties will allow operators to configure the sync frequency between Cloud Controller, the Policy Server, and the Diego Cells for ASGs. The more frequent the syncing, the faster ASG updates will be propagated through the foundation. However, more frequent syncing will add more load to the system.
- **[Feature Improvement]** Operators can now configure debug logging for NATS servers in the “Networking” tab.
- Bump binary-offline-buildpack to version [1.1.41](#)
- Bump bpm to version [1.4.20](#)
- Bump capi to version [1.209.0](#)
- Bump cf-cli to version [2.1.0](#)
- Bump cf-networking to version [3.70.0](#)
- Bump cflinuxfs3 to version [0.630.0](#)
- Bump cflinuxfs4 to version [1.302.0](#)
- Bump credhub to version [2.13.3](#)
- Bump diego to version [2.117.0](#)
- Bump dotnet-core-offline-buildpack to version [2.4.63](#)
- Bump garden-runc to version [1.71.0](#)
- Bump go-offline-buildpack to version [1.10.61](#)
- Bump java-offline-buildpack to version [4.83.0](#)
- Bump log-cache to version [3.2.0](#)
- Bump loggregator-agent to version [8.3.8](#)
- Bump nats to version [56.46.0](#)
- Bump nfs-volume to version [7.27.0](#)
- Bump nginx-offline-buildpack to version [1.2.49](#)
- Bump nodejs-offline-buildpack to version [1.8.62](#)
- Bump notifications to version [79.0.0](#)

- Bump notifications-ui to version 56.0.0
- Bump php-offline-buildpack to version 4.6.50
- Bump push-apps-manager-release to version 677.0.71
- Bump push-usage-service-release to version 674.0.165
- Bump python-offline-buildpack to version 1.8.57
- Bump r-offline-buildpack to version 1.2.44
- Bump routing to version 0.337.0
- Bump ruby-offline-buildpack to version 1.10.44
- Bump silk to version 3.70.0
- Bump smb-volume to version 3.25.0
- Bump staticfile-offline-buildpack to version 1.8.38

## Known Issues

### Addresses Policy Server database migration failures and crashes

Addresses Policy Server database migration failures and crashes seen when upgrading to version 4.0.35, 6.0.15, and 10.0.5.



This reverts the previous feature improvement - "Multiple enhancements to Application Security Group data syncing when using Dynamic ASGs at very high scale" which was added in 4.0.35, 6.0.15, and 10.0.5.

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs component since the previous patch version of TAS for VMs:

Component	Vulnerabilities Resolved
bpm	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> </ul>
capi	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-5w6v-399v-w3cc</a> (low)</li> </ul>
cf-cli	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-vvgc-356p-c3xw</a> (medium)</li> </ul>
cf-networking	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-fhg8-qxh5-7q3w</a> (critical)</li> <li>• <a href="#">CVE-2025-22871</a> (critical)</li> </ul>

Component	Vulnerabilities Resolved
credhub	<ul style="list-style-type: none"> <li>• GHSA-45hx-wfhj-473x (critical)</li> <li>• GHSA-h376-j262-vhq6 (critical)</li> <li>• GHSA-7rpj-hg47-cx62 (high)</li> <li>• GHSA-22wvj-vf5f-wrvj (high)</li> <li>• CVE-2025-21587 (high)</li> <li>• CVE-2025-30698 (medium)</li> </ul>
diego	<ul style="list-style-type: none"> <li>• GHSA-fhg8-qxh5-7q3w (critical)</li> <li>• CVE-2025-22871 (critical)</li> <li>• CVE-2024-45336 (medium)</li> <li>• CVE-2024-45341 (medium)</li> <li>• CVE-2025-22866 (medium)</li> <li>• GHSA-29wx-vh33-7x7r (low)</li> </ul>
garden-runc	<ul style="list-style-type: none"> <li>• CVE-2025-22871 (critical)</li> <li>• GHSA-c6gw-w398-hv78 (medium)</li> <li>• GHSA-265r-hfxg-fhmg (medium)</li> </ul>
nats	<ul style="list-style-type: none"> <li>• GHSA-fhg8-qxh5-7q3w (critical)</li> </ul>
nfs-volume	<ul style="list-style-type: none"> <li>• CVE-2025-22871 (critical)</li> </ul>
notifications-ui	<ul style="list-style-type: none"> <li>• CVE-2025-22871 (critical)</li> </ul>
push-usage-service-release	<ul style="list-style-type: none"> <li>• GHSA-7wqh-767x-r66v (high)</li> <li>• GHSA-7fc5-f82f-cx69 (medium)</li> <li>• GHSA-j3g3-5qv5-52mj (medium)</li> <li>• GHSA-8cqg-6mh2-7j6v (medium)</li> <li>• GHSA-vfm5-rmrh-j26v (low)</li> </ul>
routing	<ul style="list-style-type: none"> <li>• GHSA-fhg8-qxh5-7q3w (critical)</li> <li>• CVE-2024-45336 (medium)</li> <li>• CVE-2024-45341 (medium)</li> <li>• CVE-2025-22866 (medium)</li> </ul>
silk	<ul style="list-style-type: none"> <li>• CVE-2025-22871 (critical)</li> </ul>
smb-volume	<ul style="list-style-type: none"> <li>• CVE-2025-22871 (critical)</li> </ul>

Component	Version	Release Notes
ubuntu-jammy stemcell	1.808	
backup-and-restore-sdk	1.19.45	

Component	Version	Release Notes
binary-offline-buildpack	1.1.41	<p>▼ v1.1.41</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 4.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 4.zip - binary_buildpack-cached-windows-v1.1.24.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.40</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 3.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 3.zip - binary_buildpack-cached-windows-v1.1.23.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.39</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 3.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 3.zip - binary_buildpack-cached-windows-v1.1.23.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---  ## Default Versions   Name   Version    --- --- </pre>
		<p>▼ v1.1.38</p> <pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 2.zip</pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- binary_buildpack-cached-cflinuxfs4-v1.1.2.zip</li> <li>- binary_buildpack-cached-windows-v1.1.22.zip</li> </ul> <pre>## Packaged Binaries   Name   Version   CF Stacks     -   -   -   ## Default Versions   Name   Version     -   -  </pre> <p>▼ v1.1.37</p>
		<pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 1.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 2.zip - binary_buildpack-cached-windows-v1.1.22.z ip</pre> <pre>## Packaged Binaries   Name   Version   CF Stacks     -   -   -   ## Default Versions   Name   Version     -   -  </pre>
		<p>▼ v1.1.36</p>
		<pre>Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.2 1.zip - binary_buildpack-cached-cflinuxfs4-v1.1.2 1.zip - binary_buildpack-cached-windows-v1.1.21.z ip</pre> <pre>## Packaged Binaries   Name   Version   CF Stacks     -   -   -   ## Default Versions   Name   Version     -   -  </pre>
bosh-dns-aliases	0.0.4	
bpm	1.4.20	
capi	1.209.0	
cf-autoscaling	250.4.3	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
cf-cli	2.1.0	<p>▼ v2.1.0</p> <pre>### Included CF CLI versions: 8.13.0</pre>
cf-networking	3.70.0	<p>▼ v3.70.0</p> <pre>## 3.70.0 **Release Date**: May 09, 2025 ## Changes - Bug Fix: Add migrations to rollback the bad v0082 and v0083 migrations. <a href="https://github.com/cloudfoundry/cf-networking-release/pull/326">https://github.com/cloudfoundry/cf-networking-release/pull/326</a> - Thank you @mariash and @geofffranks! See these two docs on the issues this fixes: - [Known Issue: policy server pre-start fails] (<a href="https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/12-known-issues-with-too-many-bound-spaces.md">https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/12-known-issues-with-too-many-bound-spaces.md</a>) - [Known Issue: policy server ASG syncer fails in crash loop] (<a href="https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/13-known-issue-policy-server-asg-syncer-crash-loop.md">https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/13-known-issue-policy-server-asg-syncer-crash-loop.md</a>) ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.69.0...v3.70.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.69.0...v3.70.0</a> ## Resources - Download release 3.70.0 from <a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.70.0">bosh.io</a> (<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.70.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.70.0</a>).</pre>
cflinuxfs3	0.630.0	
cflinuxfs4	1.302.0	
count-cores-indicator	2.0.0	

Component	Version	Release Notes
credhub	2.13.3	<p>▼ 2.13.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed - various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.13.2...2.13.3">https://github.com/pivotal/credhub-release/compare/2.13.2...2.13.3</a></pre></div> <p>▼ 2.13.2</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * H2 (for testing only) major version bump by @peterhaochen47 in <a href="https://github.com/cloudfoundry/credhub/pull/893">https://github.com/cloudfoundry/credhub/pull/893</a>. * Other various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.13.1...2.13.2">https://github.com/pivotal/credhub-release/compare/2.13.1...2.13.2</a></pre></div>

Component	Version	Release Notes
diego	2.117.0	<p>▼ v2.117.0</p> <pre> ## 2.117.0 **Release Date**: May 06, 2025 ## Changes - Upgrade to go 1.24 - New property: `diego.rep.extra_root_fs_directory` (thanks @winkingturtle-vmw!) - Directory for extra desired root fses to be used by rep - New properties: `diego.executor.proxy_healthcheck_interval` and `diego.executor.enable_container_proxy_healthcheck` (thanks @Viktor-Velkov!) - Configuration for envoy proxy healthchecks - `cnbapplifecycle` is now a standalone module - Add BBS Advanced Metrics <a href="https://github.com/cloudfoundry/diego-release/pull/996">https://github.com/cloudfoundry/diego-release/pull/996</a> (thanks @n-sandalski and @PlamenDoychev!) ## Bosh Job Spec changes: ```diff diff --git a/jobs/bbs/spec b/jobs/bbs/spec index 9204a8d4c..49ad1d095 100644 --- a/jobs/bbs/spec +++ b/jobs/bbs/spec @@ -147,6 +147,18 @@ properties: description: "Timeout in seconds to receive a response to the keepalive ping. If a response is not received within this time, the lock et client will reconnect to another server." default: 22 + diego.bbs.metrics.advanced_metrics.enabled: +   description: Enables emitting BBS Metrics per specified routes/endpoints in advance d_metrics, useful for debugging issues. May impact performances. +   default: false + + diego.bbs.metrics.advanced_metrics.route_config.request_count: +   description: Set the routes for which request_count should be emitted. If empty, no request_count metrics will be emitted. +   default: [] + + diego.bbs.metrics.advanced_metrics.route_config.request_latency: +   description: Set the routes for which request_latency should be emitted. If empty, no request_latency metrics will be emitted. +   default: [] + limits.open_files: description: Maximum number of files (inclu </pre>

Component	Version	Release Notes
		<pre> ding sockets) the BBS process may have open.  default: 100000  diff --git a/jobs/rep/spec b/jobs/rep/spec  index ecff35fa5..c7e46eeb5 100644  --- a/jobs/rep/spec  +++ b/jobs/rep/spec  @@ -57,6 +57,9 @@  properties:  diego.rep.sidecar_rootfs_path:  description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/var/vcap/packages/cflinuxfs4/rootfs.tar'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses"  default: ""  + diego.rep.extra_root_fs_dir:  + description: "dir to scan for extra rootfs to be loaded by rep"  + default: "/var/vcap/store/rootfses"  diego.rep.rootfs_providers:  description: "Array of schemes for which the underlying garden can support arbitrary root filesystems"  default:  @@ -138,6 +141,12 @@  properties:  diego.executor.use_schedulable_disk_size:  description: "Use total space available to containers reported by Garden. If false the total size of image plugin store minus max_cache_size_in_bytes is used."  default: false  + diego.executor.proxy_healthcheck_interval:  + description: "Interval that checks envoy responsiveness every 30s."  + default: "30s"  + diego.executor.enable_container_proxy_healthcheck:  + description: "When set, enables the liveness health check for the envoy proxy in the container."  + default: false  diego.executor.garden.address:  description: "Garden server listening address."  default: /var/vcap/data/garden/garden.sock  diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec  index d34483c0b..3383a8bf4 100644  --- a/jobs/rep_windows/spec  +++ b/jobs/rep_windows/spec  @@ -48,6 +48,9 @@  properties:  diego.rep.sidecar_rootfs_path:  description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/tmp/windows2012R2'). Must be one of the </pre>

Component	Version	Release Notes
		<pre> e preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses"   default: ""   + diego.rep.extra_root_fs_dir:   +   description: "dir to scan for extra rootfs to be loaded by rep"   +   default: "/var/vcap/store/rootfses"   diego.rep.rootfs_providers:   description: "Array of schemes for which the underlying garden can support arbitrary root filesystems"   default: [] @@ -133,6 +136,12 @@   properties:   diego.executor.use_schedulable_disk_size:   description: "Use total space available to containers reported by Garden. If false the total size of image plugin store minus max_cache_size_in_bytes is used."   default: false   + diego.executor.proxy_healthcheck_interval:   +   description: "Interval that checks envoy responsiveness."   +   default: "30s"   + diego.executor.enable_container_proxy_healthcheck:   +   description: "When set, enables the liveness health check for the envoy proxy in the container."   +   default: false   diego.executor.garden.address:   description: "Garden server listening address."   default: 127.0.0.1:9241 diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index 901e5236d..b42ae9d49 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ --- name: vizzini packages: - - golang-1.23-linux + - golang-1.24-linux - vizzini templates: ``` ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.116.0...v2.117.0">https://github.com/cloudfoundry/diego-release/compare/v2.116.0...v2.117.0</a> ## Resources - [Download release 2.117.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry) </pre>

Component	Version	Release Notes
		<p>ry/diego-release?version=2.117.0).</p> <p>▼ v2.116.0</p> <pre>## 2.116.0 **Release Date**: March 28, 2025 ## Changes - bump go version ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.115.0...v2.116.0">https://github.com/cloudfoundry/diego-release/compare/v2.115.0...v2.116.0</a> ## Resources - [Download release 2.116.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.116.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.116.0</a>).</pre> <p>▼ v2.115.0</p> <pre>## 2.115.0 **Release Date**: February 24, 2025 ## Changes - Expose configuration option to select rootfs used for container's sidecar processes. This configuration resolves the following issue [983] (<a href="https://github.com/cloudfoundry/diego-release/issues/983">https://github.com/cloudfoundry/diego-release/issues/983</a>) observed on systems running with multiple FS stacks. Thanks to @Ivo1116 , @PlamenDoychev! ## Bosh Job Spec changes: ```diff diff --git a/jobs/rep/spec b/jobs/rep/spec index 012234e12..ecff35fa5 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -54,6 +54,9 @@ properties:  default: false  diego.rep.preloaded_rootfses:  description: "Array of name:absolute_path pairs representing root filesystems preloaded onto the underlying garden" + diego.rep.sidecar_rootfs_path: +   description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/var/vcap/packages/cflinuxfs4/rootfs.tar'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses" +   default: ""  diego.rep.rootfs_providers:  description: "Array of schemes for which the underlying garden can support arbitrary root filesystems"  default:</pre>

Component	Version	Release Notes
		<pre> diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 4a7dfefc6..d34483c0b 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -45,6 +45,9 @@ properties: description: "Array of name:absolute_path pairs representing root filesystems preloaded onto the underlying garden" default: - windows2012R2:/tmp/windows2012R2 + diego.rep.sidecar_rootfs_path: +   description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/tmp/windows2012R2'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses" +   default: "" diego.rep.rootfs_providers: description: "Array of schemes for which the underlying garden can support arbitrary root filesystems" default: [] ``` ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.114.0...v2.115.0">https://github.com/cloudfoundry/diego-release/compare/v2.114.0...v2.115.0</a> ## Resources - [Download release 2.115.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.115.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.115.0</a>).</pre>

#### ▼ v2.114.0

```

## 2.114.0
**Release Date**: February 18, 2025
## Changes
- Add support to Diego for file-based service bindings - https://github.com/cloudfoundry/diego-release/pull/990 - Thank you @klapkov, @dimitardimitrov13!
## Bosh Job Spec changes:
```diff
diff --git a/jobs/rep/spec b/jobs/rep/spec
index 0737d9d1a..012234e12 100644
--- a/jobs/rep/spec
+++ b/jobs/rep/spec
@@ -22,7 +22,8 @@ templates:
tls.key.erb: config/certs/tls.key
tls_ca.crt.erb: config/certs/tls_ca.crt
indicators.yml.erb: config/indicators.yml
-
+ volume_mounted_files.erb: bin/volume_mounted_files
+
```

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> packages: - pid_utils - rep ``` ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.113.0...v2.114.0">https://github.com/cloudfoundry/diego-release/compare/v2.113.0...v2.114.0</a> ## Resources - [Download release 2.114.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.114.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.114.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           |         | <p>▼ v2.113.0</p> <pre> ## 2.113.0 **Release Date**: February 03, 2025 ## Changes - ⚠ BREAKING CHANGE! : `chacha20-poly1305@openssh.com` has been removed from the default allowed ciphers for ssh-proxy. <a href="https://github.com/cloudfoundry/diego-ssh/pull/62">https://github.com/cloudfoundry/diego-ssh/pull/62</a> Thank you @DimitarSch - Bump dependencies - <a href="https://github.com/cloudfoundry/diego-release/pull/986">https://github.com/cloudfoundry/diego-release/pull/986</a> Keep `filepath-securejoin` at `v0.3.6` until `runc` is compatible with `v0.4.0` (thanks @winkingturtle-vmw) ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.112.0...v2.113.0">https://github.com/cloudfoundry/diego-release/compare/v2.112.0...v2.113.0</a> ## Resources - [Download release 2.113.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.113.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.113.0</a>). </pre> |
|           |         | <p>▼ v2.112.0</p> <pre> ## 2.112.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies. ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.111.0...v2.112.0">https://github.com/cloudfoundry/diego-release/compare/v2.111.0...v2.112.0</a> ## Resources - [Download release 2.112.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.112.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.112.0</a>). </pre> <p>▼ v2.111.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## 2.111.0 **Release Date**: December 19, 2024 ## Changes - Bump envoy from 1.32.2 to 1.32.3. [Envoy v1.32.3] (<a href="https://github.com/envoyproxy/envoy/releases/tag/v1.32.3">https://github.com/envoyproxy/envoy/releases/tag/v1.32.3</a>) contains multiple CVE fixes. - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.110.0...v2.111.0">https://github.com/cloudfoundry/diego-release/compare/v2.110.0...v2.111.0</a> ## Resources - [Download release 2.111.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.111.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.111.0</a>). </pre> |
|           |         | <p>▼ v2.110.0</p> <pre> ## 2.110.0 **Release Date**: December 10, 2024 ## Changes - Dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.109.0...v2.110.0">https://github.com/cloudfoundry/diego-release/compare/v2.109.0...v2.110.0</a> ## Resources - [Download release 2.110.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.110.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.110.0</a>). </pre>                                                                                                                                                                                                   |
|           |         | <p>▼ v2.109.0</p> <pre> ## 2.109.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.108.0...v2.109.0">https://github.com/cloudfoundry/diego-release/compare/v2.108.0...v2.109.0</a> ## Resources - [Download release 2.109.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.109.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.109.0</a>). </pre>                                                                                                                                                                                                   |
|           |         | <p>▼ v2.108.0</p> <pre> ## 2.108.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>- Bump dependancies</li> <li>## Built with go 1.23.4</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.107.0...v2.108.0">https://github.com/cloudfoundry/diego-release/compare/v2.107.0...v2.108.0</a></li> <li>## Resources</li> <li>- [Download release 2.108.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.108.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.108.0</a>).</li> </ul>                                                                                                                                                                                                                              |
|           |         | <p>▼ v2.107.0</p> <pre> ## 2.107.0 **Release Date**: November 20, 2024 ## Changes - Bump Go - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.106.0...v2.107.0">https://github.com/cloudfoundry/diego-release/compare/v2.106.0...v2.107.0</a> ## Resources - [Download release 2.107.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.107.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.107.0</a>). </pre>                                                                                                                                                                                                                 |
|           |         | <p>▼ v2.106.0</p> <pre> ## 2.106.0 **Release Date**: November 12, 2024 ## Changes - Various dependency bumps - Various doc and link fixes - Azure zone logs are now in json format with timestamps: <a href="https://github.com/cloudfoundry/diego-release/pull/958">https://github.com/cloudfoundry/diego-release/pull/958</a> ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.105.0...v2.106.0">https://github.com/cloudfoundry/diego-release/compare/v2.105.0...v2.106.0</a> ## Resources - [Download release 2.106.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.106.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.106.0</a>). </pre> |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.63  | <p>▼ v2.4.63</p> <pre>Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.46.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.46.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfli nuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinu xfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinu xfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4     libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    --- ---    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x  </pre> <p>▼ v2.4.62</p> <pre>Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.45.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.45.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3  </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>   dotnet-runtime   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cflinuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> |

#### ▼ v2.4.61

```

Buildpacks provided by this bosh release:
- dotnet-core_buildpack-cached-cflinuxfs3-v2.4.44.zip
- dotnet-core_buildpack-cached-cflinuxfs4-v2.4.44.zip
## Packaged Binaries
| Name | Version | CF Stacks |
|-|-|
| libunwind | 1.8.1 | cflinuxfs3, cflinuxfs4 |
| node | 20.16.0 | cflinuxfs3 |
| node | 22.14.0 | cflinuxfs4 |
| bower | 1.8.14 | cflinuxfs4, cflinuxfs3 |
| dotnet-aspnetcore | 8.0.15 | cflinuxfs4, cflinuxfs3 |
| dotnet-aspnetcore | 9.0.4 | cflinuxfs4, cflinuxfs3 |
| dotnet-runtime | 8.0.15 | cflinuxfs4, cflinuxfs3 |
| dotnet-runtime | 9.0.4 | cflinuxfs4, cflinuxfs3 |
| dotnet-sdk | 8.0.408 | cflinuxfs4, cflinuxfs3 |
| dotnet-sdk | 9.0.203 | cflinuxfs4, cflinuxfs3 |
| libgdiplus | 6.1 | cflinuxfs3, cflinuxfs4 |
|
## Default Versions
Name	Version
dotnet-runtime	8.0.x
dotnet-aspnetcore	8.0.x
dotnet-sdk	8.0.x
bower	1.8.x

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>▼ v2.4.60</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.44.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.44.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libunwind   1.8.1   cflinuxfs3, cflinuxfs 4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3     dotnet-sdk   8.0.408   cflinuxfs4, cflinu xfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinu xfs3     libgdplus   6.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> |
|           |         | <p>▼ v2.4.59</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.43.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.43.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.15   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.4   cflinuxfs4, c flinuxfs3     dotnet-runtime   8.0.15   cflinuxfs4, cfl inuxfs3     dotnet-runtime   9.0.4   cflinuxfs4, cfl inuxfs3   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>   dotnet-sdk   8.0.408   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.203   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4       libunwind   1.8.1   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> |

#### ▼ v2.4.58

```

Buildpacks provided by this bosh release:
- dotnet-core_buildpack-cached-cflinuxfs3-v2.4.43.zip
- dotnet-core_buildpack-cached-cflinuxfs4-v2.4.43.zip
## Packaged Binaries
Name	Version	CF Stacks
bower	1.8.14	cflinuxfs4, cflinuxfs3
dotnet-aspnetcore	8.0.15	cflinuxfs4, cflinuxfs3
dotnet-aspnetcore	9.0.4	cflinuxfs4, cflinuxfs3
dotnet-runtime	8.0.15	cflinuxfs4, cflinuxfs3
dotnet-runtime	9.0.4	cflinuxfs4, cflinuxfs3
dotnet-sdk	8.0.408	cflinuxfs4, cflinuxfs3
dotnet-sdk	9.0.203	cflinuxfs4, cflinuxfs3
libgdiplus	6.1	cflinuxfs3, cflinuxfs4
libunwind	1.8.1	cflinuxfs3, cflinuxfs4
node	20.16.0	cflinuxfs3
node	22.14.0	cflinuxfs4
## Default Versions
Name	Version
dotnet-runtime	8.0.x
dotnet-aspnetcore	8.0.x
dotnet-sdk	8.0.x
bower	1.8.x

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>▼ v2.4.57</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.42.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.42.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libgdiplus   6.1   cflinuxfs3, cflinuxfs4     libunwind   1.8.1   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-sdk   8.0.407   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.202   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.71.0  | <p>▼ v1.71.0</p> <pre>## 1.71.0 **Release Date**: May 05, 2025 ## Changes - Fixed an issue with noble stemcells for memory calculation - [Bump iptables to libnftnl-1.2.9] (<a href="https://github.com/cloudfoundry/garden-runc-release/commit/5b59b3dd8d0b8bd25cc34773588e74f7c030b743">https://github.com/cloudfoundry/garden-runc-release/commit/5b59b3dd8d0b8bd25cc34773588e74f7c030b743</a>) - [Bump libtool to debian/2.5.4-4] (<a href="https://github.com/cloudfoundry/garden-runc-release/commit/9d7382c9f3d3dc54a9e5b68fb307058d93acff84">https://github.com/cloudfoundry/garden-runc-release/commit/9d7382c9f3d3dc54a9e5b68fb307058d93acff84</a>) ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.70.0...v1.71.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.70.0...v1.71.0</a> ## Resources - [Download release 1.71.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.71.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.71.0</a>).</pre> |

| Component            | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| go-offline-buildpack | 1.10.61 | <p>▼ v1.10.61</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.41.zip - go_buildpack-cached-cflinuxfs4-v1.10.41.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.9   cflinuxfs3, cflinuxfs4     go   1.24.3   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre> |
|                      |         | <p>▼ v1.10.60</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.40.zip - go_buildpack-cached-cflinuxfs4-v1.10.40.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    go   1.23.8   cflinuxfs3, cflinuxfs4     go   1.24.2   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    go   1.23.x  </pre> |
|                      |         | <p>▼ v1.10.59</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.39.zip - go_buildpack-cached-cflinuxfs4-v1.10.39.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4     go   1.24.2   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4  </pre>                                                                                                           |

| Component | Version    | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |            | <pre>   dep   0.5.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.23.x   </pre>                                                                                                                                                                                                                                                                                                                                                                         |
|           | ▼ v1.10.58 | <pre> Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.39.zip - go_buildpack-cached-cflinuxfs4-v1.10.39.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4     go   1.24.2   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.23.x   </pre> |
|           | ▼ v1.10.57 | <pre> Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.38.zip - go_buildpack-cached-cflinuxfs4-v1.10.38.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4     go   1.24.2   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.23.x   </pre> |
|           | ▼ v1.10.56 | <pre> Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.37.zip - go_buildpack-cached-cflinuxfs4-v1.10.37.zip ## Packaged Binaries </pre>                                                                                                                                                                                                                                                                                                                    |

| Component | Version    | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |            | <pre>   Name   Version   CF Stacks     - - -    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version     - -    go   1.22.x   </pre>                                                                                                                                                            |
|           | ▼ v1.10.55 | <pre> Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.37.zip - go_buildpack-cached-cflinuxfs4-v1.10.37.zip ## Packaged Binaries   Name   Version   CF Stacks     - - -    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version     - -    go   1.22.x   </pre> |
|           | ▼ v1.10.54 | <pre> Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.36.zip - go_buildpack-cached-cflinuxfs4-v1.10.36.zip ## Packaged Binaries   Name   Version   CF Stacks     - - -    godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version     - -    go   1.22.x   </pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-offline-buildpack | 4.83.0  | <p>▼ v4.83.0</p> <pre> Buildpacks provided by this bosh release:   - java-buildpack-offline-cflinuxfs3-v4.81.   0.zip   - java-buildpack-offline-cflinuxfs4-v4.81.   0.zip    I'm pleased to announce the release of the   `java-buildpack`, version `4.81.0`.    This release includes a bumped AppDynamics   agent version, 25.2.0 and PR #16 which adds k   eepAlive settings to the default `server.xml`   for the buildpack-supplied Tomcat.      Dependency   Version   CVEs   Release Notes       -----   -----   -----   -----       AppDynamics Agent   `25.2.0_36823`     [R elease Notes] (<a href="https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes">https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes</a>)       Azure Application Insights Agent   `3.7.1 `     [Release Notes] (<a href="https://github.com/Micr osoft/ApplicationInsights-Java/releases">https://github.com/Micr osoft/ApplicationInsights-Java/releases</a>)       CA Introscope APM Framework   `24.9.1_19 `       Client Certificate Mapper   `2.0.1`   Incl uded inline above   Included inline above       Container Security Provider   `1.20.0_REL EASE`   Included inline above   Included inlin e above       Contrast Security Agent   `6.16.0`     [R elease Notes] (<a href="https://docs.contrastsecurity.c om/en/java-agent-release-notes-and-archive.ht ml">https://docs.contrastsecurity.c om/en/java-agent-release-notes-and-archive.ht ml</a>)       Datadog APM Javaagent   `1.47.3`     [Rel ease Notes] (<a href="https://github.com/DataDog/dd-tr ace-java/releases">https://github.com/DataDog/dd-tr ace-java/releases</a>)       Elastic APM Agent   `1.53.0`     [Release Notes] (<a href="https://www.elastic.co/guide/en/apm/ag ent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/ag ent/java/current/release-notes.html</a>)       Gemalto Luna Security Provider   `7.4.0 `     [Release Notes] (<a href="https://www.thalesdocs.co m/gphsm/luna/7/docs/network/Content/CRN/Luna/ CRN_Luna.htm">https://www.thalesdocs.co m/gphsm/luna/7/docs/network/Content/CRN/Luna/ CRN_Luna.htm</a>)       Geode Tomcat Session Store   `2.0.3`             Google Stackdriver Profiler   `0.1.0`     [Release Notes] (<a href="https://cloud.google.com/prof iler/docs/release-notes">https://cloud.google.com/prof iler/docs/release-notes</a>)       Groovy   `2.5.23`     [Release Notes] (<a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a>)       JaCoCo Agent   `0.8.13`     [Release Note s] (<a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a>)         Java CFEnv   `3.4.0`     [Release Notes] (<a href="https://github.com/pivotal-cf/java-cfenv/rel ">https://github.com/pivotal-cf/java-cfenv/rel </a>)   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> eases)     Java Memory Assistant Agent   `0.5.0`         Java Memory Assistant Clean Up   `0.1.0`         JProfiler Profiler   `13.0.7`     [Change Log] (<a href="https://www.ej-technologies.com/downloads/jprofiler/changelog.html">https://www.ej-technologies.com/downloads/jprofiler/changelog.html</a>)     JRebel Agent   `2025.2.0`     [ChangeLog] (<a href="https://www.jrebel.com/products/jrebel/changelog">https://www.jrebel.com/products/jrebel/changelog</a>)     jvmkill Agent   `1.17.0_RELEASE`   Included inline above   Included inline above     MariaDB JDBC Driver   `2.7.9`     [Release Notes] (<a href="https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/">https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/</a>)     Memory Calculator   `3.13.0_RELEASE`   Included inline above   Included inline above     Metric Writer   `3.5.0_RELEASE`   Included inline above   Included inline above     New Relic Agent   `8.19.0`     [Release Notes] (<a href="https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/">https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/</a>)     Open Telemetry Agent   `2.14.0`     [Release Notes] (<a href="https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases">https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases</a>)       OpenJDK JRE 11   `11.0.26_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/</a>)     OpenJDK JRE 17   `17.0.14_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/</a>)     OpenJDK JRE 21   `21.0.6_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/</a>)     OpenJDK JRE 8   `1.8.0_442`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/</a>)     PostgreSQL JDBC Driver   `42.7.5`     [ChangeLog] (<a href="https://jdbc.postgresql.org/documentation/changelog.html">https://jdbc.postgresql.org/documentation/changelog.html</a>)     Redis Session Store   `1.3.6_RELEASE`   Included inline above   Included inline above     Riverbed Appinternals Agent   `11.8.5_BL527`         SeaLights Agent   `4.0.2570`         SkyWalking   `9.4.0`     [ChangeLog] (<a href="http://skywalking.org">http://skywalking.org</a>)   </pre> |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |         | <pre>s://github.com/apache/skywalking/tree/master/ changes)     Splunk OpenTelemetry Java Agent   `2.10.0 `   [Release Notes] (<a href="https://github.com/signalfx/splunk-otel-java/releases">https://github.com/signalfx/splunk-otel-java/releases</a>)     Spring Auto-reconfiguration   `2.12.0_RELEASE`   Included inline above   Included inline above     Spring Boot CLI   `2.7.18`         Spring Boot Container Customizer   `2.6.0_RELEASE`   Included inline above   Included inline above     Spring Kit CLI   `0.4.0`         Takipi Agent   `4.73.3`     [Release Notes] (<a href="https://doc.overops.com/docs/whats-new">https://doc.overops.com/docs/whats-new</a>)     Tomcat 10.1   `10.1.39`   [Security] (<a href="https://tomcat.apache.org/security-10.html">https://tomcat.apache.org/security-10.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-10.1-doc/changelog.html">https://tomcat.apache.org/tomcat-10.1-doc/changelog.html</a>)     Tomcat 9   `9.0.102`   [Security] (<a href="https://tomcat.apache.org/security-9.html">https://tomcat.apache.org/security-9.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-9.0-doc/changelog.html">https://tomcat.apache.org/tomcat-9.0-doc/changelog.html</a>)     Tomcat Access Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above     Tomcat Lifecycle Support   `3.4.0_RELEASE`   Included inline above   Included inline above     Tomcat Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above     YourKit Profiler   `2025.3.134`     [Release Notes] (<a href="https://www.yourkit.com/download/yjp_2024_9_builds.jsp">https://www.yourkit.com/download/yjp_2024_9_builds.jsp</a>)  </pre> |
| java-native-image-cnb-buildpack | 0.11.22 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| <b>Component</b>  | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache         | 3.2.0          | <p>▼ v3.2.0</p> <pre> ## What's Changed * Bump dependencies * Exchange go-syslog lib with a maintained version by @chombium in https://github.com/cloudfoundry/log-cache-release/pull/601 * Add option to use nontransparent framing ingress by @pbusko in https://github.com/cloudfoundry/log-cache-release/pull/600 ## New Contributors * @pbusko made their first contribution in https://github.com/cloudfoundry/log-cache-release/pull/600 **Full Changelog**: https://github.com/cloudfoundry/log-cache-release/compare/v3.1.10...v3.2.0 </pre> |
| loggregator       | 107.0.21       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| loggregator-agent | 8.3.8          | <p>▼ v8.3.8</p> <pre> ## What's Changed * Bump dependencies * Fix connection keep-alive time for https- batch syslog drains by @nicklas-dohrn in http s://github.com/cloudfoundry/loggregator-agent- release/pull/699 **Full Changelog**: https://github.com/cloudfoundry/loggregator-agent-release/compare/v 8.3.7...v8.3.8 </pre>                                                                                                                                                                                                                   |
| metric-registrar  | 4.0.8          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| mysql-monitoring  | 10.23.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats      | 56.46.0 | <p>▼ v56.46.0</p> <pre> ## 56.46.0 **Release Date**: April 30, 2025 ## Changes - Change the default of "no_advertise" to true for nats to match nats-tls.  ## Bosh Job Spec changes: ```diff diff --git a/jobs/nats/spec b/jobs/nats/spec c index 68e5221..3a4bba6 100644 --- a/jobs/nats/spec +++ b/jobs/nats/spec @@ -86,8 +86,8 @@ properties: description: "Port for pprof. 0 means disabled." default: 0 nats.no_advertise: -   description: "When configured to true, this nats server will not be advertised to any nats clients. This is defaulted to false for backwards compatibility." -   default: false +   description: "When configured to true, this nats server will not be advertised to any nats clients." +   default: true nats.write_deadline: description: "Maximum number of seconds the server will block when writing. Once this threshold is exceeded the connection will be closed and the client will be considered as Slow Consumer." default: 2s ``` ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.45.0...v56.46.0">https://github.com/cloudfoundry/nats-release/compare/v56.45.0...v56.46.0</a> ## Resources - [Download release 56.46.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.46.0). </pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.27.0  | <p>▼ v7.27.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## 7.27.0 **Release Date**: May 02, 2025 ## Changes - Dependency bumps ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.25.0...v7.27.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.25.0...v7.27.0</a> ## Resources - [Download release 7.27.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.27.0).</pre></div> |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack | 1.2.49  | <p>▼ v1.2.49</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 3.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 3.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre> |
|                         |         | <p>▼ v1.2.48</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 2.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 2.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre> |
|                         |         | <p>▼ v1.2.47</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 1.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 1.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    openresty   1.21.4.3   cflinuxfs3, cflinu xfs4  </pre>                                                                                                                                                                                                                |

| Component | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |           | <pre>   openresty   1.25.3.2   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x   </pre>                                                                                                                                                                                                                                                         |
|           | ▼ v1.2.46 | <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 1.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 1.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x   </pre> |
|           | ▼ v1.2.45 | <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 0.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 0.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x   </pre> |
|           | ▼ v1.2.44 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.3 0.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.3 0.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    - -   nginx   1.27.x   </pre>                  |
|           |         | <p>▼ v1.2.43</p> <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.2 9.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.2 9.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    - -   nginx   1.27.x   </pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.62  | <p>▼ v1.8.62</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 4.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 4.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    node   18.x     python   3.11.x   </pre> |
|                          |         | <p>▼ v1.8.61</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 3.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4 3.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    node   18.x     python   3.11.x   </pre>            |
|                          |         | <p>▼ v1.8.60</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|           |         | <pre> 2.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4  2.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    -    node   18.x     python   3.11.x   </pre>                                                                                                         |
|           |         | <p>▼ v1.8.59</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.4  2.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.4  2.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    node   18.20.7   cflinuxfs3, cflinuxfs4     node   18.20.8   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.14.0   cflinuxfs4     node   22.15.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    -    node   18.x     python   3.11.x   </pre> |
|           |         | <p>▼ v1.8.58</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3  9.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3  9.zip ## Packaged Binaries   Name   Version   CF Stacks   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |         | <pre>   - - -    node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version     - -    node   18.x     python   3.11.x   </pre> <p>▼ v1.8.57</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3 9.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3 9.zip ## Packaged Binaries   Name   Version   CF Stacks     - - -    node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version     - -    node   18.x     python   3.11.x   </pre> |
| notifications | 79.0.0  | <p>▼ v79.0.0</p> <pre> * update dependencies * compile notifications during compilation step, not during errand time. Don't use build packs to compile. Should reduce failures in a irrgapped environments </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Component        | Version | Release Notes                                                                                                                                                                                                                        |
|------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications-ui | 56.0.0  | <p>▼ v56.0.0</p> <div style="border: 1px solid #ccc; padding: 5px;"><ul style="list-style-type: none"><li>* compile notifications-ui during the compilation step, not using buildpack</li><li>* update dependencies.</li></ul></div> |
| otel-collector   | 0.11.4  |                                                                                                                                                                                                                                      |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.50  | <p>▼ v4.6.50</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.31.zip - php_buildpack-cached-cflinuxfs4-v4.6.31.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     php   8.3.21   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4        ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3        httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4    ## Default Versions   Name   Version    --- ---    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre> <p>▼ v4.6.49</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.30.zip - php_buildpack-cached-cflinuxfs4-v4.6.30.zip  ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.14   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  _     ruby   3.0.5   cflinuxfs4       appdynamics   23.11.0-839   cflinuxfs4, c flinuxfs3       composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4       newrelic   10.21.0.11   cflinuxfs3, cflin uxfs4   ## Default Versions   Name   Version    - -    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8    ▼ v4.6.48  Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.29.z ip - php_buildpack-cached-cflinuxfs4-v4.6.29.z ip ## Packaged Binaries   Name   Version   CF Stacks    - -    httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflin uxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.14   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4     ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, c flinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>▼ v4.6.47</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.29.zip - php_buildpack-cached-cflinuxfs4-v4.6.29.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.14   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3     ## Default Versions   Name   Version    - -    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre> |
|           |         | <p>▼ v4.6.46</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.28.zip - php_buildpack-cached-cflinuxfs4-v4.6.28.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>   php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.14   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4   ## Default Versions   Name   Version    - -    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre> <p>▼ v4.6.45</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.28.zip - php_buildpack-cached-cflinuxfs4-v4.6.28.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.8   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.14   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4       ruby   3.0.5   cflinuxfs4   ## Default Versions   Name   Version    - -    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.8   </pre> |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release  | 677.0.71  | <p>▼ 677.0.71</p> <pre>* fix resource limits on scheduler jobs to be based on the web instance of the application * update apps-manager to be able to handle timezones for unreleased version of scheduler * css updates and fixes</pre>                                                                                                                                                                                                                                             |
| push-offline-docs-release  | 6.0.169   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| push-usage-service-release | 674.0.165 | <p>▼ v674.0.165</p> <pre>## Changes * creating final release 674.0.164</pre> <p>▼ v674.0.164</p> <pre>## Changes * TNZ-38618 - Usage Service Support for cfl inuixfs3 (#33) * creating final release 674.0.163</pre> <p>▼ v674.0.163</p> <pre>## Changes * Add new delayed job endpoints for customer self-service</pre> <p>▼ v674.0.162</p> <pre>## Changes * TNZ-36923 - Usage Service - CVEs April 20 25 (#32) * creating final release 674.0.161 * update gcp bucket names</pre> |
| pxc                        | 1.0.39    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.57  | <p>▼ v1.8.57</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 5.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 5.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     setuptools   80.4.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3   ## Default Versions   Name   Version    --- ---    python   3.10.x   </pre> <p>▼ v1.8.56</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 4.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 4.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4   </pre> |

| Component | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |           | <pre>   python   3.13.3   cflinuxfs3, cflinuxfs4     setuptools   80.3.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|           | ▼ v1.8.55 | <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 3.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 3.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    setuptools   79.0.1   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> |
|           | ▼ v1.8.54 | <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 3.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 3.zip </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> 3.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    setuptools   79.0.1   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.10   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    - -    python   3.10.x   </pre> <p>▼ v1.8.53</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 0.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 0.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|           |         | <pre>   setuptools   78.1.0   cflinuxfs4, cflinux fs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> <p>▼ v1.8.52</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.4 0.zip - python_buildpack-cached-cflinuxfs4-v1.8.4 0.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3     miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.22   cflinuxfs3, cflinuxfs4     python   3.10.17   cflinuxfs3, cflinuxfs4     python   3.11.12   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.3   cflinuxfs3, cflinuxfs4     setuptools   78.1.0   cflinuxfs4, cflinux fs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| r-offline-buildpack | 1.2.44  | <p>▼ v1.2.44</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.25.zip - r_buildpack-cached-cflinuxfs4-v1.2.25.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.2.43</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.24.zip - r_buildpack-cached-cflinuxfs4-v1.2.24.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.2.42</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.23.zip - r_buildpack-cached-cflinuxfs4-v1.2.23.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- --- </pre> <p>▼ v1.2.41</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.23.zip - r_buildpack-cached-cflinuxfs4-v1.2.23.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- --- </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre>                                                                                                                                                                                                                |
|           |         | <p>▼ v1.2.40</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.22.zip - r_buildpack-cached-cflinuxfs4-v1.2.22.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre> |
|           |         | <p>▼ v1.2.39</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.22.zip - r_buildpack-cached-cflinuxfs4-v1.2.22.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre> |
|           |         | <p>▼ v1.2.38</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.21.zip - r_buildpack-cached-cflinuxfs4-v1.2.21.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.337.0 | <p>▼ v0.337.0</p> <pre> ## 0.337.0 **Release Date**: May 07, 2025 ## Changes - gorouter source code has been inlined directly into this release, and the separate repository has been archived. Thank you so much @maxmoehl!!! - Additional request timeout properties have been added to routing-release + gorouter to provide more flexibility with overall request timeouts. Previously `request_timeout_in_seconds` applied to both HTTP/1 and HTTP/2 requests. This limited the ability to guard against slowloris attacks for HTTP/1 requests while also allowing GRPC streams over HTTP/2 to live indefinitely. `request_timeout_in_seconds` is now used as a default value for the new `http_1_request_timeout_in_seconds` and `http_2_request_timeout_in_seconds` properties. See the property descriptions below for more information. Thanks @kart2bc! - Dependency updates ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index d373561e..a88b19ab 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -523,6 +523,16 @@ properties: Requests from router to backend endpoints that are longer than this duration will be canceled and logged as `backend-request-timeout` errors. If set to 0 this timeout is disabled. default: 900 + http_1_request_timeout_in_seconds: +   description:   +     The amount of time HTTP/1 requests from the Gorouter to apps are allowed to live before being canceled. +     Enter value in seconds. Set to -1 to disable timeouts. If set to 0, it inherits the value from request_timeout_in_seconds. +   default: 0 + http_2_request_timeout_in_seconds: +   description:   +     The amount of time HTTP/2 requests from the Gorouter to apps are allowed to live before being canceled. +     Enter value in seconds. Set to -1 to disable timeouts. If set to 0, it inherits the value from request_timeout_in_seconds. +   default: 0 endpoint_dial_timeout_in_seconds:</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> description:     Maximum time in seconds for gorouter to establish a TCP connection with a backend. This timeout comes before `tls_handshake_timeout_in_seconds`.   ```  ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.336.0...v0.337.0">https://github.com/cloudfoundry/routing-release/compare/v0.336.0...v0.337.0</a> ## Resources - [Download release 0.337.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.337.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.337.0</a>). </pre>                                                                                                                                                                                                                                                                                                                          |
|           |         | <p>▼ v0.336.0</p> <pre> ## 0.336.0 **Release Date**: April 28, 2025 ## Changes - haproxy bumped to v2.8.15 - When retrying retriable requests, Gorouter will now refresh the backend pool to detect backends that have been registered after the initial request was made. Thanks @mariash! ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.335.0...v0.336.0">https://github.com/cloudfoundry/routing-release/compare/v0.335.0...v0.336.0</a> ## Resources - [Download release 0.336.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.336.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.336.0</a>). </pre>                                                                                                                                                                                                             |
|           |         | <p>▼ v0.335.0</p> <pre> ## 0.335.0 **Release Date**: April 16, 2025 ## Changes - feat: introduce gorouter_time metrics - <a href="https://github.com/cloudfoundry/gorouter/pull/473">https://github.com/cloudfoundry/gorouter/pull/473</a> - Thanks @kart2bc - fix: add OU in client-cert field_map - <a href="https://github.com/cloudfoundry/routing-release/pull/464">https://github.com/cloudfoundry/routing-release/pull/464</a> - Thanks @plowin - dep: various dependency bumps and golang patch ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.334.0...v0.335.0">https://github.com/cloudfoundry/routing-release/compare/v0.334.0...v0.335.0</a> ## Resources - [Download release 0.335.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.335.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.335.0</a>). </pre> |

| Component | Version | Release Notes                                        |
|-----------|---------|------------------------------------------------------|
|           |         | <a href="#">ry/routing-release?version=0.335.0</a> . |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack | 1.10.44 | <p>▼ v1.10.44</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 8.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 8.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.8   cflinuxfs4, cflinuxfs3     yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.8   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    --- ---    ruby   3.2.x   </pre> <p>▼ v1.10.43</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 7.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 7.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   bundler   2.6.8   cflinuxfs4, cflinuxfs3     jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4   </pre> |

| Component | Version    | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |            | <pre>   rubygems   3.6.8   cflinuxfs4, cflinuxfs3     yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    ruby   3.2.x   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|           | ▼ v1.10.42 | <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 5.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 5.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.7   cflinuxfs4, cflinuxfs3     jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.7   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    ruby   3.2.x   </pre> |
|           | ▼ v1.10.41 | <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 5.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 5.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.7   cflinuxfs4, cflinuxfs3     jruby   9.4.8.0   cflinuxfs3, cflinuxfs4   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component | Version    | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |            | <pre>   node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.7   cflinuxfs4, cflinuxfs3    ## Default Versions   Name   Version    - -    ruby   3.2.x   </pre>                                                                                                                                                                                                                                                                                                                                                 |
|           | ▼ v1.10.40 | <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 5.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 5.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.7   cflinuxfs4, cflinuxfs3       jruby   9.4.8.0   cflinuxfs3, cflinuxfs4       node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.7   cflinuxfs4, cflinuxfs3    ## Default Versions   Name   Version    - -    ruby   3.2.x   </pre> |
|           | ▼ v1.10.39 | <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 5.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 5.zip </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |         | <pre> 5.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.7   cflinuxfs4, cflinuxfs3     jruby   9.4.8.0   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.7   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    ruby   3.2.x   </pre> |
| web-servers-cnb-buildpack | 0.15.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| silk                      | 3.70.0  | <p>▼ v3.70.0</p> <pre> ## 3.70.0 **Release Date**: May 09, 2025 ## Changes - Bump dependencies ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.69.0...v3.70.0">https://github.com/cloudfoundry/silk-release/compare/v3.69.0...v3.70.0</a> ## Resources - [Download release 3.70.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.70.0). </pre>                                                                                                                                                                                                                                                                |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume  | 3.25.0  | <p>▼ v3.25.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## 3.25.0 **Release Date**: May 06, 2025 ## Changes - bump dependancies ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.24.0...v3.25.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.24.0...v3.25.0</a>. ## Resources - [Download release 3.25.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.25.0).</pre></div> |
| smoke-tests | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.8.38  | <p>▼ v1.8.38</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.33.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.33.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    --- ---    nginx   1.27.x  </pre> |
|                              |         | <p>▼ v1.8.37</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.32.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.32.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre>           |
|                              |         | <p>▼ v1.8.36</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.31.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.31.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre>           |
|                              |         | <p>▼ v1.8.35</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.31.zip</pre>                                                                                                                                                                                                                                         |

| Component | Version          | Release Notes                                                                                                                                                                                                                                                                                                                            |
|-----------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                  | <pre>- staticfile_buildpack-cached-cflinuxfs4-v 1.6.31.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre>                                                                                                 |
|           | <b>▼ v1.8.34</b> | <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.30.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.30.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |
|           | <b>▼ v1.8.33</b> | <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.30.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.30.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.5   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |
|           | <b>▼ v1.8.32</b> | <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.29.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.29.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.4   cflinuxfs3, cflinuxfs4  </pre>                                                                 |

| Component              | Version | Release Notes                                                                  |
|------------------------|---------|--------------------------------------------------------------------------------|
|                        |         | <pre>## Default Versions   Name   Version     -   -     nginx   1.27.x  </pre> |
| statsd-injector        | 1.11.48 |                                                                                |
| syslog                 | 12.3.9  |                                                                                |
| system-metrics-scraper | 4.0.18  |                                                                                |
| uaa                    | 77.20.4 |                                                                                |
| tanzu-jammy-stack      | 1.0.1   |                                                                                |

## TAS for VMs v6.0 Release notes

These are the release notes for VMware Tanzu Application Service for VMs (TAS for VMs) v6.0 patch releases v6.0.11 to v6.0.15.



**Known Issue:** cf-networking-release versions 3.67.0 - 3.70.0 contain a bug that breaks pagination for listing and removing container-to-container (c2c) network policies when the user has more than 100 roles, as is often the case for users involved in automated provisioning. This bug only affects listing and removing network policies and not enforcing those policies. This bug also does not affect Application Security Groups. For more information, see this [Knowledge Base article](#).

**Affected versions:** 6.0.14, 6.0.15, 6.0.16

TAS for VMs is certified by the Cloud Foundry Foundation for 2024.

For more information about the Cloud Foundry Certified Provider Program, see [How Do I Become a Certified Provider?](#) on the Cloud Foundry website.

Because VMware uses the Percona Distribution for MySQL, expect a time lag between Oracle releasing a MySQL patch and VMware releasing TAS for VMs containing that patch.

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**Deprecation Notice:** Cloud Foundry Command-Line Interface (cf CLI) v7 is deprecated and will lose support. For how to upgrade to cf CLI v8 see [Upgrading to cf CLI v8](#).



**Important cross-version issues:**

- **v6.0.7 - v6.0.11** versions contain a bug that causes intermittent TCP connectivity issues between TAS for VMs and tiles that use `routing` release 0.301.0 or earlier, such as Tanzu for MySQL on Cloud Foundry v3.3.0 and earlier, and Redis for Tanzu Application Service v3.5.0 and earlier. For details, see [TCP Routes from Tiles are Pruned Intermittently Resulting in connectivity issues](#)
- **v6.0.0 - v6.0.3** versions contain an RFC protocol issue with Gorouter, CVE-2024-22279, that can lead to denial of service. The issue has been fixed. For details,

see TNZ-2024-0100.

## Releases

### 6.0.15

**Release Date:** 04/15/2025



Do not upgrade to TAS for VMs v10.0.5, v6.0.15, or v4.0.35 if you are using dynamic ASGs enabled with Silk, as configured under **Networking**, and a MySQL database, as configured under **Databases**. These releases have policy server database issues that the next patch releases will resolve. For details, see the following articles in the Broadcom Support KB:

- [Migration failures cause policy server pre-start errors](#)
- [Cloud Controller "policy-server-asg-syncer" job in crash loop](#)

- **[Feature]** There is a new “Enable container network traffic metrics for app instances” property in the “Networking” tab
- **[Feature Improvement]** Multiple enhancements to Application Security Group data syncing when using Dynamic ASGs at very high scale
- **[Breaking Change]** Gorouter now uses Go 1.24, because of this Gorouter’s limit on 1xx informational responses has changed. It previously aborted a request and returned an error after receiving more than 5 1xx responses. It now returns an error if the total size of all 1xx responses exceeds 10MB.
- Bump binary-offline-buildpack to version [1.1.35](#)
- Bump bpm to version [1.4.17](#)
- Bump capi to version [1.206.0](#)
- Bump cf-cli to version [2.0.0](#)
- Bump cf-networking to version [3.69.0](#)
- Bump cflinuxfs3 to version [0.623.0](#)
- Bump cflinuxfs4 to version [1.296.0](#)
- Bump credhub to version [2.13.1](#)
- Bump dotnet-core-offline-buildpack to version [2.4.56](#)
- Bump go-offline-buildpack to version [1.10.53](#)
- Bump java-offline-buildpack to version [4.82.0](#)
- Bump log-cache to version [3.1.10](#)
- Bump loggregator to version [107.0.21](#)
- Bump loggregator-agent to version [8.3.7](#)

- Bump metric-registrar to version [4.0.8](#)
- Bump mysql-monitoring to version [10.23.0](#)
- Bump nats to version [56.45.0](#)
- Bump nfs-volume to version [7.25.0](#)
- Bump nginx-offline-buildpack to version [1.2.42](#)
- Bump nodejs-offline-buildpack to version [1.8.56](#)
- Bump notifications to version [78.0.0](#)
- Bump otel-collector to version [0.11.4](#)
- Bump php-offline-buildpack to version [4.6.44](#)
- Bump push-apps-manager-release to version [677.0.70](#)
- Bump push-usage-service-release to version [674.0.161](#)
- Bump pxc to version [1.0.39](#)
- Bump python-offline-buildpack to version [1.8.51](#)
- Bump r-offline-buildpack to version [1.2.37](#)
- Bump routing to version [0.334.0](#)
- Bump ruby-offline-buildpack to version [1.10.38](#)
- Bump silk to version [3.69.0](#)
- Bump smb-volume to version [3.24.0](#)
- Bump staticfile-offline-buildpack to version [1.8.31](#)
- Bump statsd-injector to version [1.11.48](#)
- Bump syslog to version [12.3.9](#)
- Bump system-metrics-scraper to version [4.0.18](#)

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs component since the previous patch version of TAS for VMs:

| Component | Vulnerabilities Resolved                                                                                                                           |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| capi      | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-mrxw-mxhj-p664</a> (high)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul> |

| Component                  | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-cli                     | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-v778-237x-gjrc</a> (critical)</li> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">GHSA-hcg3-q754-cr77</a> (high)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">GHSA-qxp5-gwg8-xv66</a> (medium)</li> </ul>                                                       |
| diego                      | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-fhg8-qxh5-7q3w</a> (critical)</li> </ul>                                                                                                                                                                                                                                                                                                                            |
| log-cache                  | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| loggregator                | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| loggregator-agent          | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| metric-registrar           | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                           |
| mysql-monitoring           | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| notifications              | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                                                                                                                                 |
| otel-collector             | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                           |
| push-usage-service-release | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-7g2v-jj9q-g3rg</a> (medium)</li> <li>• <a href="#">GHSA-2x5m-9ch4-qgr</a> (low)</li> <li>• <a href="#">GHSA-638j-pmjw-jq48</a> (low)</li> <li>• <a href="#">GHSA-rxv5-gxqc-xx8g</a> (low)</li> <li>• <a href="#">GHSA-vvfq-8hwr-qm4m</a> (low)</li> <li>• <a href="#">GHSA-w8gc-x259-rc7x</a> (low)</li> <li>• <a href="#">GHSA-cfjx-w229-hgx5</a> (low)</li> </ul> |
| pxc                        | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| routing                    | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-mh63-6h87-95cp</a> (high)</li> </ul>                                                                                                                                                                                                                                                                                                                                |

| Component              | Vulnerabilities Resolved                                                                                                                      |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| silk                   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> </ul>                                                     |
| statsd-injector        | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                  |
| syslog                 | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul> |
| system-metrics-scraper | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                  |

## Component Release Notes

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                               |
|--------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ubuntu-jammy stemcell    | 1.803   |                                                                                                                                                                                                                                                                                                                                             |
| backup-and-restore-sdk   | 1.19.45 |                                                                                                                                                                                                                                                                                                                                             |
| binary-offline-buildpack | 1.1.35  | <p>▼ v1.1.35</p> <pre> Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.20.zip - binary_buildpack-cached-cflinuxfs4-v1.1.20.zip - binary_buildpack-cached-windows-v1.1.20.zip  ## Packaged Binaries   Name   Version   CF Stacks     -   -   -   ## Default Versions   Name   Version     -   -   </pre> |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                             |
| bpm                      | 1.4.17  |                                                                                                                                                                                                                                                                                                                                             |
| capi                     | 1.206.0 |                                                                                                                                                                                                                                                                                                                                             |
| cf-autoscaling           | 250.4.3 |                                                                                                                                                                                                                                                                                                                                             |
| cf-cli                   | 2.0.0   | <p>▼ v2.0.0</p> <pre> ### Included CF CLI versions: 8.12.0 </pre>                                                                                                                                                                                                                                                                           |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.69.0  | <p>▼ v3.69.0</p> <pre>## 3.69.0 **Release Date**: April 02, 2025 ## Changes - Testing fixes + additional logging for cf-networking-acceptance-tests ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.68.0...v3.69.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.68.0...v3.69.0</a> ## Resources - [Download release 3.69.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.69.0).</pre> <p>▼ v3.68.0</p> <pre>## 3.68.0 **Release Date**: March 24, 2025 ## Changes - Updated to golang 1.24.1 from 1.23.x - Adds support for an asg-data-last-change endpoint on policy-server to optimize calls from vxlan-policy-agent - Adds better indexing of ASG data when running the policy-server database on mysql-8.x or newer. ## Bosh Job Spec changes: ```diff diff --git a/jobs/performance-test-sd/spec b/jobs/performance-test-sd/spec index fd83a044..b492caaa 100644 --- a/jobs/performance-test-sd/spec +++ b/jobs/performance-test-sd/spec @@ -6,7 +6,7 @@ templates:  config.json.erb: config.json  packages:  - - golang-1.23-linux + - golang-1.24-linux  - performance-test-sd  consumes:  ```  ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.67.0...v3.68.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.67.0...v3.68.0</a> ## Resources - [Download release 3.68.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.68.0).</pre> |
| cflinuxfs3    | 0.623.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4            | 1.296.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| credhub               | 2.13.1  | <p>▼ 2.13.1</p> <pre>## What's Changed ### Fixes * Fixes `error occurred while attempting to decode the Jwt`, particularly when used with Concourse (<a href="https://github.com/cloudfoundry/credhub/pull/881">https://github.com/cloudfoundry/credhub/pull/881</a>) ### Dependency upgrades * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.13.0...2.13.1">https://github.com/pivotal/credhub-release/compare/2.13.0...2.13.1</a></pre> <p>▼ 2.13.0</p> <pre>## What's Changed ### Feature enhancement * Regenerate certificate with adjustable key length by @jbuecher &amp; @agimbel in <a href="https://github.com/cloudfoundry/credhub/pull/870">https://github.com/cloudfoundry/credhub/pull/870</a> ### Dependency upgrades * Replace dependencies to old Spring Security OAuth 2.x with supported Spring Security libraries by @joeeltgroth &amp; @hsinn0 in <a href="https://github.com/cloudfoundry/credhub/pull/854">https://github.com/cloudfoundry/credhub/pull/854</a> * Other various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.108...2.13.0">https://github.com/pivotal/credhub-release/compare/2.12.108...2.13.0</a></pre> |
| diego                 | 2.105.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.56  | <p>▼ v2.4.56</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.41.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.41.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-sdk   8.0.407   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.202   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4     libunwind   1.8.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> <p>▼ v2.4.55</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.40.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.40.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.3   cflinuxfs4, cflinuxfs3   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>   dotnet-sdk   8.0.407   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.202   cflinuxfs4, cflinuxfs3     libgdiplus   6.1   cflinuxfs3, cflinuxfs4       libunwind   1.8.1   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> |

#### ▼ v2.4.54

```

Buildpacks provided by this bosh release:
- dotnet-core_buildpack-cached-cflinuxfs3-v2.4.39.zip
- dotnet-core_buildpack-cached-cflinuxfs4-v2.4.39.zip
## Packaged Binaries
| Name | Version | CF Stacks |
|-|-|
| libgdiplus | 6.1 | cflinuxfs3, cflinuxfs4 |
|
libunwind	1.8.1	cflinuxfs3, cflinuxfs4
node	20.16.0	cflinuxfs3
node	22.14.0	cflinuxfs4
bower	1.8.14	cflinuxfs4, cflinuxfs3
dotnet-aspnetcore	8.0.14	cflinuxfs4, cflinuxfs3
dotnet-aspnetcore	9.0.3	cflinuxfs4, cflinuxfs3
dotnet-runtime	8.0.14	cflinuxfs4, cflinuxfs3
dotnet-runtime	9.0.3	cflinuxfs4, cflinuxfs3
dotnet-sdk	8.0.407	cflinuxfs4, cflinuxfs3
dotnet-sdk	9.0.202	cflinuxfs4, cflinuxfs3
## Default Versions
Name	Version
dotnet-runtime	8.0.x
dotnet-aspnetcore	8.0.x
dotnet-sdk	8.0.x
bower	1.8.x

```

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |         | <p>▼ v2.4.53</p> <pre> Buildpacks provided by this bosh release: - dotnet-core_buildpack-cached-cflinuxfs3-v 2.4.39.zip - dotnet-core_buildpack-cached-cflinuxfs4-v 2.4.39.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libgdiplus   6.1   cflinuxfs3, cflinuxfs4     libunwind   1.8.1   cflinuxfs3, cflinuxfs4     node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     bower   1.8.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-aspnetcore   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-runtime   8.0.14   cflinuxfs4, cflinuxfs3     dotnet-runtime   9.0.3   cflinuxfs4, cflinuxfs3     dotnet-sdk   8.0.407   cflinuxfs4, cflinuxfs3     dotnet-sdk   9.0.202   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   </pre> |
| garden-runc | 1.70.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Component            | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| go-offline-buildpack | 1.10.53 | <p>▼ v1.10.53</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.35.zip - go_buildpack-cached-cflinuxfs4-v1.10.35.zip  ## Packaged Binaries   Name   Version   CF Stacks    - - -   dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.8   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> |
|                      |         | <p>▼ v1.10.52</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.34.zip - go_buildpack-cached-cflinuxfs4-v1.10.34.zip  ## Packaged Binaries   Name   Version   CF Stacks    - - -   glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.7   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> |
|                      |         | <p>▼ v1.10.51</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.33.zip - go_buildpack-cached-cflinuxfs4-v1.10.33.zip  ## Packaged Binaries   Name   Version   CF Stacks    - - -   glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.7   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4  </pre>                                                                                                       |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  dep   0.5.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> <p>▼ v1.10.49</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.33.zip - go_buildpack-cached-cflinuxfs4-v1.10.33.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.7   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4     dep   0.5.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> |

| Component                        | Version           | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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                                                                                                                                                                                                                     |                                  |         |  |                                                                                                                                                                 |                             |             |  |  |                           |         |                       |                       |                             |                   |                       |                       |                         |          |                                                                                                                                                                                                 |  |                       |          |                                                                                                                                       |  |                   |          |                                                                                                                                                                                       |  |                                |         |                                                                                                                                                                                                         |  |                            |         |  |  |                             |         |                                                                                                                                             |  |        |          |                                                                                                                     |  |              |          |                                                                                                                       |  |            |         |                                                                                                                                       |  |                             |         |  |  |                                |         |  |  |
|----------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|---------------|-------------------|----------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|--|--|---------------------------|---------|-----------------------|-----------------------|-----------------------------|-------------------|-----------------------|-----------------------|-------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------|--|-------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------|---------|--|--|-----------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------|--|--------|----------|---------------------------------------------------------------------------------------------------------------------|--|--------------|----------|-----------------------------------------------------------------------------------------------------------------------|--|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|---------|--|--|--------------------------------|---------|--|--|
| java-offline-buildpack           | 4.82.0            | <p>▼ v4.82.0</p> <div style="border: 1px solid black; padding: 10px;"> <p>This BOSH release contains the following buildpacks:</p> <ul style="list-style-type: none"> <li>* java-buildpack-offline-cflinuxfs3-v4.81.0.zip</li> <li>* java-buildpack-offline-cflinuxfs4-v4.81.0.zip</li> </ul> <p>Java Buildpack v4.81.0</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Dependency</th> <th style="text-align: left;">Version</th> <th style="text-align: left;">CVEs</th> <th style="text-align: left;">Release Notes</th> </tr> </thead> <tbody> <tr> <td>AppDynamics Agent</td> <td>`25.2.0_36823`</td> <td></td> <td>[Release Notes] (<a href="https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes">https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes</a>)</td> </tr> <tr> <td>Azure Application Insights Agent</td> <td>`3.7.1`</td> <td></td> <td>[Release Notes] (<a href="https://github.com/Microsoft/ApplicationInsights-Java/releases">https://github.com/Microsoft/ApplicationInsights-Java/releases</a>)</td> </tr> <tr> <td>CA Introscope APM Framework</td> <td>`24.9.1_19`</td> <td></td> <td></td> </tr> <tr> <td>Client Certificate Mapper</td> <td>`2.0.1`</td> <td>Included inline above</td> <td>Included inline above</td> </tr> <tr> <td>Container Security Provider</td> <td>`1.20.0_REL_EASE`</td> <td>Included inline above</td> <td>Included inline above</td> </tr> <tr> <td>Contrast Security Agent</td> <td>`6.16.0`</td> <td>[Release Notes] (<a href="https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html">https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html</a>)</td> <td></td> </tr> <tr> <td>Datadog APM Javaagent</td> <td>`1.47.3`</td> <td>[Release Notes] (<a href="https://github.com/DataDog/dd-trace-java/releases">https://github.com/DataDog/dd-trace-java/releases</a>)</td> <td></td> </tr> <tr> <td>Elastic APM Agent</td> <td>`1.53.0`</td> <td>[Release Notes] (<a href="https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html</a>)</td> <td></td> </tr> <tr> <td>Gemalto Luna Security Provider</td> <td>`7.4.0`</td> <td>[Release Notes] (<a href="https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm">https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm</a>)</td> <td></td> </tr> <tr> <td>Geode Tomcat Session Store</td> <td>`2.0.3`</td> <td></td> <td></td> </tr> <tr> <td>Google Stackdriver Profiler</td> <td>`0.1.0`</td> <td>[Release Notes] (<a href="https://cloud.google.com/profiler/docs/release-notes">https://cloud.google.com/profiler/docs/release-notes</a>)</td> <td></td> </tr> <tr> <td>Groovy</td> <td>`2.5.23`</td> <td>[Release Notes] (<a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a>)</td> <td></td> </tr> <tr> <td>JaCoCo Agent</td> <td>`0.8.13`</td> <td>[Release Notes] (<a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a>)</td> <td></td> </tr> <tr> <td>Java CFEnv</td> <td>`3.4.0`</td> <td>[Release Notes] (<a href="https://github.com/pivotal-cf/java-cfenv/releases">https://github.com/pivotal-cf/java-cfenv/releases</a>)</td> <td></td> </tr> <tr> <td>Java Memory Assistant Agent</td> <td>`0.5.0`</td> <td></td> <td></td> </tr> <tr> <td>Java Memory Assistant Clean Up</td> <td>`0.1.0`</td> <td></td> <td></td> </tr> </tbody> </table> </div> | Dependency                                                                                                                                                                                                                                      | Version | CVEs | Release Notes | AppDynamics Agent | `25.2.0_36823` |  | [Release Notes] ( <a href="https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes">https://docs.appdynamics.com/apd/onprem/24.x/latest/en/product-and-release-announcements/release-notes</a> ) | Azure Application Insights Agent | `3.7.1` |  | [Release Notes] ( <a href="https://github.com/Microsoft/ApplicationInsights-Java/releases">https://github.com/Microsoft/ApplicationInsights-Java/releases</a> ) | CA Introscope APM Framework | `24.9.1_19` |  |  | Client Certificate Mapper | `2.0.1` | Included inline above | Included inline above | Container Security Provider | `1.20.0_REL_EASE` | Included inline above | Included inline above | Contrast Security Agent | `6.16.0` | [Release Notes] ( <a href="https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html">https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html</a> ) |  | Datadog APM Javaagent | `1.47.3` | [Release Notes] ( <a href="https://github.com/DataDog/dd-trace-java/releases">https://github.com/DataDog/dd-trace-java/releases</a> ) |  | Elastic APM Agent | `1.53.0` | [Release Notes] ( <a href="https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html</a> ) |  | Gemalto Luna Security Provider | `7.4.0` | [Release Notes] ( <a href="https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm">https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm</a> ) |  | Geode Tomcat Session Store | `2.0.3` |  |  | Google Stackdriver Profiler | `0.1.0` | [Release Notes] ( <a href="https://cloud.google.com/profiler/docs/release-notes">https://cloud.google.com/profiler/docs/release-notes</a> ) |  | Groovy | `2.5.23` | [Release Notes] ( <a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a> ) |  | JaCoCo Agent | `0.8.13` | [Release Notes] ( <a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a> ) |  | Java CFEnv | `3.4.0` | [Release Notes] ( <a href="https://github.com/pivotal-cf/java-cfenv/releases">https://github.com/pivotal-cf/java-cfenv/releases</a> ) |  | Java Memory Assistant Agent | `0.5.0` |  |  | Java Memory Assistant Clean Up | `0.1.0` |  |  |
| Dependency                       | Version           | CVEs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| AppDynamics Agent                | `25.2.0_36823`    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| Azure Application Insights Agent | `3.7.1`           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| CA Introscope APM Framework      | `24.9.1_19`       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| Client Certificate Mapper        | `2.0.1`           | Included inline above                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Container Security Provider      | `1.20.0_REL_EASE` | Included inline above                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Contrast Security Agent          | `6.16.0`          | [Release Notes] ( <a href="https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html">https://docs.contrastsecurity.com/en/java-agent-release-notes-and-archive.html</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| Datadog APM Javaagent            | `1.47.3`          | [Release Notes] ( <a href="https://github.com/DataDog/dd-trace-java/releases">https://github.com/DataDog/dd-trace-java/releases</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Elastic APM Agent                | `1.53.0`          | [Release Notes] ( <a href="https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html">https://www.elastic.co/guide/en/apm/agent/java/current/release-notes.html</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Gemalto Luna Security Provider   | `7.4.0`           | [Release Notes] ( <a href="https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm">https://www.thalesdocs.com/gphsm/luna/7/docs/network/Content/CRN/Luna/CRN_Luna.htm</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Geode Tomcat Session Store       | `2.0.3`           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| Google Stackdriver Profiler      | `0.1.0`           | [Release Notes] ( <a href="https://cloud.google.com/profiler/docs/release-notes">https://cloud.google.com/profiler/docs/release-notes</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Groovy                           | `2.5.23`          | [Release Notes] ( <a href="http://www.groovy-lang.org/releases.html">http://www.groovy-lang.org/releases.html</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| JaCoCo Agent                     | `0.8.13`          | [Release Notes] ( <a href="https://github.com/jacoco/jacoco/releases">https://github.com/jacoco/jacoco/releases</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Java CFEnv                       | `3.4.0`           | [Release Notes] ( <a href="https://github.com/pivotal-cf/java-cfenv/releases">https://github.com/pivotal-cf/java-cfenv/releases</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Java Memory Assistant Agent      | `0.5.0`           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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                                                                                                                                                                                                                     |                                  |         |  |                                                                                                                                                                 |                             |             |  |  |                           |         |                       |                       |                             |                   |                       |                       |                         |          |                                                                                                                                                                                                 |  |                       |          |                                                                                                                                       |  |                   |          |                                                                                                                                                                                       |  |                                |         |                                                                                                                                                                                                         |  |                            |         |  |  |                             |         |                                                                                                                                             |  |        |          |                                                                                                                     |  |              |          |                                                                                                                       |  |            |         |                                                                                                                                       |  |                             |         |  |  |                                |         |  |  |
| Java Memory Assistant Clean Up   | `0.1.0`           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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                                                             |  |                   |          |                                                                                                                                                                                       |  |                                |         |                                                                                                                                                                                                         |  |                            |         |  |  |                             |         |                                                                                                                                             |  |        |          |                                                                                                                     |  |              |          |                                                                                                                       |  |            |         |                                                                                                                                       |  |                             |         |  |  |                                |         |  |  |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>     </p> <p>  JProfiler Profiler   `13.0.7`     [Change Log] (<a href="https://www.ej-technologies.com/downloads/jprofiler/changelog.html">https://www.ej-technologies.com/downloads/jprofiler/changelog.html</a>)  </p> <p>  JRebel Agent   `2025.2.0`     [ChangeLog] (<a href="https://www.jrebel.com/products/jrebel/changelog">https://www.jrebel.com/products/jrebel/changelog</a>)  </p> <p>  jvmkill Agent   `1.17.0_RELEASE`   Included inline above   Included inline above  </p> <p>  MariaDB JDBC Driver   `2.7.9`     [Release Notes] (<a href="https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/">https://mariadb.com/kb/en/mariadb-connector-j-2-7-9-release-notes/</a>)  </p> <p>  Memory Calculator   `3.13.0_RELEASE`   Included inline above   Included inline above  </p> <p>  Metric Writer   `3.5.0_RELEASE`   Included inline above   Included inline above  </p> <p>  New Relic Agent   `8.19.0`     [Release Notes] (<a href="https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/">https://docs.newrelic.com/docs/release-notes/agent-release-notes/java-release-notes/</a>)  </p> <p>  Open Telemetry Agent   `2.14.0`     [Release Notes] (<a href="https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases">https://github.com/open-telemetry/opentelemetry-java-instrumentation/releases</a>)  </p> <p>  OpenJDK JRE 11   `11.0.26_9`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/11.0.26b9/general/release-notes/</a>)  </p> <p>  OpenJDK JRE 17   `17.0.14_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/17.0.14b10/general/release-notes/</a>)  </p> <p>  OpenJDK JRE 21   `21.0.6_10`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/21.0.6b10/general/release-notes/</a>)  </p> <p>  OpenJDK JRE 8   `1.8.0_442`   [Risk Matrix] (<a href="https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA">https://www.oracle.com/security-alerts/cpujan2025.html#AppendixJAVA</a>)   [Release Notes] (<a href="https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/">https://docs.bell-sw.com/liberica-jdk/8u442b7/general/release-notes/</a>)  </p> <p>  PostgreSQL JDBC Driver   `42.7.5`     [ChangeLog] (<a href="https://jdbc.postgresql.org/documentation/changelog.html">https://jdbc.postgresql.org/documentation/changelog.html</a>)  </p> <p>  Redis Session Store   `1.3.6_RELEASE`   Included inline above   Included inline above  </p> <p>  Riverbed Appinternals Agent   `11.8.5_BL527`      </p> <p>  SeaLights Agent   `4.0.2570`      </p> <p>  SkyWalking   `9.4.0`     [ChangeLog] (<a href="https://github.com/apache/skywalking/tree/master/changes">https://github.com/apache/skywalking/tree/master/changes</a>)  </p> <p>  Splunk OpenTelemetry Java Agent   `2.10.0`     [Release Notes] (<a href="https://github.com/sign">https://github.com/sign</a></p> |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |         | <pre> alfx/splunk-otel-java/releases)     Spring Auto-reconfiguration   `2.12.0_RELEASE`   Included inline above   Included inline above     Spring Boot CLI   `2.7.18`         Spring Boot Container Customizer   `2.6.0_RELEASE`   Included inline above   Included inline above     Spring Kit CLI   `0.4.0`         Takipi Agent   `4.73.3`     [Release Notes] (<a href="https://doc.overops.com/docs/whats-new">https://doc.overops.com/docs/whats-new</a>)     Tomcat 10.1   `10.1.39`   [Security] (<a href="https://tomcat.apache.org/security-10.html">https://tomcat.apache.org/security-10.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-10.1-doc/changelog.html">https://tomcat.apache.org/tomcat-10.1-doc/changelog.html</a>)     Tomcat 9   `9.0.102`   [Security] (<a href="https://tomcat.apache.org/security-9.html">https://tomcat.apache.org/security-9.html</a>)   [ChangeLog] (<a href="https://tomcat.apache.org/tomcat-9.0-doc/changelog.html">https://tomcat.apache.org/tomcat-9.0-doc/changelog.html</a>)     Tomcat Access Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above     Tomcat Lifecycle Support   `3.4.0_RELEASE`   Included inline above   Included inline above     Tomcat Logging Support   `3.4.0_RELEASE`   Included inline above   Included inline above     YourKit Profiler   `2025.3.134`     [Release Notes] (<a href="https://www.yourkit.com/download/yjp_2024_9_builds.jsp">https://www.yourkit.com/download/yjp_2024_9_builds.jsp</a>)   <a href="https://usw1.packages.broadcom.com/artifactory/tanzu-build-generic-prod-local/java-offline-buildpack-release/java-offline-buildpack-4.82.0.tgz">https://usw1.packages.broadcom.com/artifactory/tanzu-build-generic-prod-local/java-offline-buildpack-4.82.0.tgz</a> SHA256 checksum: 0e8055a200cb02dae2934b49f5b5c02e943724250e88a8988b32322cfbcd5f9b </pre> |
| java-native-image-cnb-buildpack | 0.11.22 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| log-cache                       | 3.1.10  | <p>▼ v3.1.10</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.9...v3.1.10">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.9...v3.1.10</a> </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| <b>Component</b>  | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator       | 107.0.21       | <p>▼ v107.0.21</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.20...v107.0.21">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.20...v107.0.21</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| loggregator-agent | 8.3.7          | <p>▼ v8.3.7</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.6...v8.3.7">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.6...v8.3.7</a></pre> <p>▼ v8.3.6</p> <pre>## What's Changed * Bump packaged Go to go1.23.7 * Bump dependencies * Fix deadlock in https-batch syslog drains by @nicklas-dohrn in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/648">https://github.com/cloudfoundry/loggregator-agent-release/pull/648</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.5...v8.3.6">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.5...v8.3.6</a></pre> |
| metric-registrar  | 4.0.8          | <p>▼ v4.0.8</p> <pre>## What's Changed * Bump packaged Golang to go1.23.8</pre> <p>▼ v4.0.7</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.7</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| mysql-monitoring  | 10.23.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats      | 56.45.0 | <p>▼ v56.45.0</p> <pre> ## 56.45.0 **Release Date**: April 04, 2025 ## Changes - Bumps nats-server to version [2.11.1-binary] (<a href="https://github.com/nats-io/nats-server/releases/tag/v2.11.1-binary">https://github.com/nats-io/nats-server/releases/tag/v2.11.1-binary</a>) to address CVE-2025-30215 - Switches from a source-based packaging of nats-server to the official binary distributions. - Bumps to golang 1.24.2 ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.44.0...v56.45.0">https://github.com/cloudfoundry/nats-release/compare/v56.44.0...v56.45.0</a> ## Resources - [Download release 56.45.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.45.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.45.0</a>).</pre> <p>▼ v56.44.0</p> <pre> ## 56.44.0 **Release Date**: April 02, 2025 ## Changes - Updates link properties related to `nats.migration_client.tls` - includes an unused binary blob for nats-server (we are in the process of switching to binary-based nats-server distributions rather than compiling from source, but this blob is not yet used. The source distribution of nats-server is still used in this release. Stay tuned!) ## Bosh Job Spec changes: ```diff diff --git a/jobs/nats/spec b/jobs/nats/spec c index daf89d6..68e5221 100644 --- a/jobs/nats/spec +++ b/jobs/nats/spec @@ -40,9 +40,9 @@ provides: - nats.write_deadline - nats.disable - nats.migrate_server.port - - nats.migrate_client.tls.ca: - - nats.migrate_client.tls.certificate: - - nats.migrate_client.tls.private_key: + - nats.migrate_client.tls.ca + - nats.migrate_client.tls.certificate + - nats.migrate_client.tls.private_key consumes: - name: nats ``` </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.43.0...v56.44.0">https://github.com/cloudfoundry/nats-release/compare/v56.43.0...v56.44.0</a> ## Resources - [Download release 56.44.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.44.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.44.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                                            |
|           |         | <p>▼ v56.43.0</p> <pre>## 56.43.0 **Release Date**: March 24, 2025 ## Changes - Bump dependencies ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.42.0...v56.43.0">https://github.com/cloudfoundry/nats-release/compare/v56.42.0...v56.43.0</a> ## Resources - [Download release 56.43.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.43.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.43.0</a>).</pre>                                                                                                                                                                                                                                                                                               |
|           |         | <p>▼ v56.42.0</p> <pre>## 56.42.0 **Release Date**: March 20, 2025 ## Changes - Add a graceful-shutdown mTLS endpoint. When called nats will shutdown gracefully, then monit will restart the process. <a href="https://github.com/cloudfoundry/nats-release/pull/87">https://github.com/cloudfoundry/nats-release/pull/87</a> thanks @ameowlia! ## Bosh Job Spec changes: ```diff diff --git a/jobs/nats-tls/spec b/jobs/nats-tls/spec index 777b98e..577abc2 100644 --- a/jobs/nats-tls/spec +++ b/jobs/nats-tls/spec @@ -40,6 +40,7 @@ provides: - nats.cluster_port - nats.external.tls.ca - nats.write_deadline + - nats.migrate_server.port consumes: - name: nats diff --git a/jobs/nats/spec b/jobs/nats/spec index 9421d59..daf89d6 100644 --- a/jobs/nats/spec +++ b/jobs/nats/spec @@ -39,6 +39,10 @@ provides: - nats.cluster_port</pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |         | <ul style="list-style-type: none"> <li>- nats.write_deadline</li> <li>- nats.disable</li> <li>+ - nats.migrate_server.port</li> <li>+ - nats.migrate_client.tls.ca:</li> <li>+ - nats.migrate_client.tls.certificate:</li> <li>+ - nats.migrate_client.tls.private_key:</li> <li>consumes:</li> <li>- name: nats</li> <li>...</li> </ul> <p>## Built with go 1.23.7<br/> <b>**Full Changelog**:</b> <a href="https://github.com/cloudfoundry/nats-release/compare/v56.41.0...v56.42.0">https://github.com/cloudfoundry/nats-release/compare/v56.41.0...v56.42.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"> <li>- [Download release 56.42.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.42.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.42.0</a>).</li> </ul>                                                                                                                                                                                                                                                                          |
| nfs-volume | 7.25.0  | <p>▼ v7.25.0</p> <pre>## 7.25.0 **Release Date**: March 24, 2025 ## Changes - Bump dependancies ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.24.0...v7.25.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.24.0...v7.25.0</a> ## Resources - [Download release 7.25.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.25.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.25.0</a>).</pre> <p>▼ v7.24.0</p> <pre>## 7.24.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.23.0...v7.24.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.23.0...v7.24.0</a> ## Resources - [Download release 7.24.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.24.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.24.0</a>).</pre> |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack | 1.2.42  | <p>▼ v1.2.42</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.2 8.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.2 8.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |
|                         |         | <p>▼ v1.2.41</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.2 7.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.2 7.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    openresty   1.21.4.3   cflinuxfs3, cflinuxfs4     openresty   1.25.3.2   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |
|                         |         | <p>▼ v1.2.40</p> <pre>Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.2 6.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.2 6.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4  </pre>                                                                                                                                                                     |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>   openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x   </pre> <p>▼ v1.2.39</p> <pre> Buildpacks provided by this bosh release: - nginx_buildpack-cached-cflinuxfs3-v1.2.2 6.zip - nginx_buildpack-cached-cflinuxfs4-v1.2.2 6.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     openresty   1.21.4.3   cflinuxfs3, cflinu xfs4     openresty   1.25.3.2   cflinuxfs3, cflinu xfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x   </pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.56  | <p>▼ v1.8.56</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3 8.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3 8.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   20.19.0   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    -    node   18.x     python   3.11.x   </pre> |
|                          |         | <p>▼ v1.8.55</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3 7.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3 7.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    yarn   1.22.22   cflinuxfs4, cflinuxfs3     node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.2   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    -    node   18.x     python   3.11.x   </pre> |
|                          |         | <p>▼ v1.8.54</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> 6.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3  6.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.2   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    -    node   18.x     python   3.11.x   </pre> <p>▼ v1.8.53</p> <div style="border: 1px solid black; padding: 10px;"> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3  6.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3  6.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.2   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4      yarn   1.22.22   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    -    node   18.x     python   3.11.x   </pre> </div> |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications | 78.0.0  | <p>▼ v78.0.0</p> <pre> commit 9e4f62c3551592bbc0056a9fac62f81ce02d 9e9f Author: PCF Toronto Concourse CI Bot Date:   Mon Apr 7 19:15:40 2025 +0000 Cuts final release 78.0.0 [ci skip] commit f978d3c42e5808ca6d63d6782dd0b9745b0e 55d6 Merge: f2255fe 90e4a16 Author: Benjamin Fuller Date:   Mon Apr 7 10:08:01 2025 -0600 Merge pull request #92 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/ginkgo/v2-2.23.3 Bump github.com/onsi/ginkgo/v2 from 2.23.0 to 2.23.3 in /src/acceptance commit f2255fe8cd649e3e9b12f7567619cf46b55a 25b7 Merge: bb230fe alf3918 Author: Benjamin Fuller Date:   Mon Apr 7 10:07:42 2025 -0600 Merge pull request #96 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/go-sql-driver/mysql-1.9.1 Bump github.com/go-sql-driver/mysql from 1. 9.0 to 1.9.1 in /src/notifications commit bb230fed16c3edfd73f49a3caec26e80e2e9 4b73 Merge: 8749654 d1a48b5 Author: Benjamin Fuller Date:   Mon Apr 7 10:05:15 2025 -0600 Merge pull request #94 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/onsi/ginkgo/v2-2.23.3 Bump github.com/onsi/ginkgo/v2 from 2.23.0 to 2.23.3 in /src/notifications commit 90e4a16ad73b311afea70fb56501aa5da238 da40 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Mon Apr 7 16:04:26 2025 +0000 Bump github.com/onsi/ginkgo/v2 from 2.23.0 to 2.23.3 in /src/acceptance Bumps [github.com/onsi/ginkgo/v2](https://github.com/onsi/ginkgo) from 2.23.0 to 2.23.3. - [Release notes](https://github.com/onsi/ginkgo/releases) - [Changelog](https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md) - [Commits](https://github.com/onsi/ginkgo/compare/v2.23.0...v2.23.3) --- updated-dependencies: - dependency-name: github.com/onsi/ginkgo/v 2 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> dependency-type: direct:production update-type: version-update:semver-patch ... Signed-off-by: dependabot[bot] commit a1f3918bc4f8d9d24ffff26fc1128eda6aa9c 92d8 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date: Mon Apr 7 16:04:01 2025 +0000 Bump github.com/go-sql-driver/mysql in /src/notifications Bumps [github.com/go-sql-driver/mysql](https://github.com/go-sql-driver/mysql) (https://github.com/go-sql-driver/mysql/blob/master/CHANGELOG.md) from 1.9.0 to 1.9.1. - [Release notes](https://github.com/go-sql-driver/mysql/releases) - [Changelog](https://github.com/go-sql-driver/mysql/blob/master/CHANGELOG.md) - [Commits](https://github.com/go-sql-driver/mysql/compare/v1.9.0...v1.9.1) --- updated-dependencies: - dependency-name: github.com/go-sql-driver/mysql dependency-type: direct:production update-type: version-update:semver-patch ... Signed-off-by: dependabot[bot] commit d1a48b5e2c66ec2c0fc944d261abd1cf555 cde0 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date: Mon Apr 7 16:02:47 2025 +0000 Bump github.com/onsi/ginkgo/v2 in /src/notifications Bumps [github.com/onsi/ginkgo/v2](https://github.com/onsi/ginkgo) (https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md) from 2.23.0 to 2.23.3. - [Release notes](https://github.com/onsi/ginkgo/releases) - [Changelog](https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md) - [Commits](https://github.com/onsi/ginkgo/compare/v2.23.0...v2.23.3) --- updated-dependencies: - dependency-name: github.com/onsi/ginkgo/v2 dependency-type: direct:production update-type: version-update:semver-patch ... Signed-off-by: dependabot[bot] commit 874965466434c9fc53be8fe30b9f4698d5fa dca2 Merge: c73eaa4 e14a6ff Author: Benjamin Fuller Date: Mon Apr 7 09:20:32 2025 -0600 Merge pull request #93 from cloudfoundry/de </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> pendabot/go_modules/src/acceptance/github.com/onsi/gomega-1.36.3   Bump github.com/onsi/gomega from 1.36.2 to 1.36.3 in /src/acceptance     commit c73eaa48091292cde98e68d259861e594fad835e       Merge: 2302c2d e796f97       Author: Benjamin Fuller       Date: Mon Apr 7 09:19:56 2025 -0600       Merge pull request #97 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/onsi/gomega-1.36.3         Bump github.com/onsi/gomega from 1.36.2 to 1.36.3 in /src/notifications           commit 2302c2d294f337648cb0181bb27fe9ale6e21999             Merge: 8a3b9b7 0a27a37             Author: Benjamin Fuller             Date: Mon Apr 7 09:19:33 2025 -0600             Merge pull request #95 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/golang-jwt/jwt/v5-5.2.2               Bump github.com/golang-jwt/jwt/v5 from 5.2.1 to 5.2.2 in /src/notifications                 commit 8a3b9b72b520b07a6263210bdb4872f7fdd398e0                   Author: PCF Event Alerts Team CI                   Date: Thu Apr 3 19:15:14 2025 +0000                   bump-golang to v0.169.0                   commit e796f975cb5b38a963a2131910e955140c0ab4dc                     Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;                     Date: Tue Mar 25 01:38:03 2025 +0000                     Bump github.com/onsi/gomega from 1.36.2 to 1.36.3 in /src/notifications                       Bumps [github.com/onsi/gomega](https://github.com/onsi/gomega) from 1.36.2 to 1.36.3.                       - [Release notes](https://github.com/onsi/gomega/releases)                       - [Changelog](https://github.com/onsi/gomega/blob/master/CHANGELOG.md)                       - [Commits](https://github.com/onsi/gomega/compare/v1.36.2...v1.36.3)                       ---                       updated-dependencies:                       - dependency-name: github.com/onsi/gomega                         dependency-type: direct:production                         update-type: version-update:semver-patch                         ...                       Signed-off-by: dependabot[bot]                       commit 0a27a375b93d49b943fe9e951adad13cdf0a                         cale                         Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;                         Date: Tue Mar 25 00:45:07 2025 +0000                         Bump github.com/golang-jwt/jwt/v5 in /src/n </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>Notifications</p> <ul style="list-style-type: none"> <li>Bumps [github.com/golang-jwt/jwt/v5] (<a href="https://github.com/golang-jwt/jwt">https://github.com/golang-jwt/jwt</a>) from 5.2.1 to 5.2.2. <ul style="list-style-type: none"> <li>- [Release notes] (<a href="https://github.com/golang-jwt/jwt/releases">https://github.com/golang-jwt/jwt/releases</a>)</li> <li>- [Changelog] (<a href="https://github.com/golang-jwt/jwt/blob/main/VERSION_HISTORY.md">https://github.com/golang-jwt/jwt/blob/main/VERSION_HISTORY.md</a>)</li> <li>- [Commits] (<a href="https://github.com/golang-jwt/jwt/compare/v5.2.1...v5.2.2">https://github.com/golang-jwt/jwt/compare/v5.2.1...v5.2.2</a>)</li> </ul> </li> </ul> <p>---</p> <p>updated-dependencies:</p> <ul style="list-style-type: none"> <li>- dependency-name: github.com/golang-jwt/jwt/v5</li> </ul> <p>dependency-type: direct:production</p> <p>update-type: version-update:semver-patch</p> <p>...</p> <p>Signed-off-by: dependabot[bot]</p> <p>commit e14a6ff96cfa7a317b1483827e150bb2467b57cb</p> <p>Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;</p> <p>Date: Tue Mar 25 00:35:29 2025 +0000</p> <p>Bump github.com/onsi/gomega from 1.36.2 to 1.36.3 in /src/acceptance</p> <ul style="list-style-type: none"> <li>Bumps [github.com/onsi/gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>) from 1.36.2 to 1.36.3.</li> <li>- [Release notes] (<a href="https://github.com/onsi/gomega/releases">https://github.com/onsi/gomega/releases</a>)</li> <li>- [Changelog] (<a href="https://github.com/onsi/gomega/blob/master/CHANGELOG.md">https://github.com/onsi/gomega/blob/master/CHANGELOG.md</a>)</li> <li>- [Commits] (<a href="https://github.com/onsi/gomega/compare/v1.36.2...v1.36.3">https://github.com/onsi/gomega/compare/v1.36.2...v1.36.3</a>)</li> </ul> <p>---</p> <p>updated-dependencies:</p> <ul style="list-style-type: none"> <li>- dependency-name: github.com/onsi/gomega</li> </ul> <p>dependency-type: direct:production</p> <p>update-type: version-update:semver-patch</p> <p>...</p> <p>Signed-off-by: dependabot[bot]</p> <p>commit e87b99b8f526170d79097f9546164316d569c1e3</p> <p>Merge: 513a7de 0e1dd9e</p> <p>Author: Benjamin Fuller</p> <p>Date: Tue Mar 18 13:58:34 2025 -0600</p> <p>Merge pull request #90 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/ginkgo/v2-2.23.0</p> <p>Bump github.com/onsi/ginkgo/v2 from 2.22.2 to 2.23.0 in /src/acceptance</p> <p>commit 513a7de5a9c980a092cb3d5e70cef24c5dca9de0</p> <p>Merge: 1accd9c 4d81901</p> <p>Author: Benjamin Fuller</p> <p>Date: Tue Mar 18 13:58:11 2025 -0600</p> <p>Merge pull request #91 from cloudfoundry/dependabot/go_modules/src/notifications/github.</p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> com/onsi/ginkgo/v2-2.23.0   Bump github.com/onsi/ginkgo/v2 from 2.22.2   to 2.23.0 in /src/notifications     commit 4d819016bdd27525fa1fd475dd73117c8500 b2f6   Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;   Date: Mon Mar 10 22:54:54 2025 +0000   Bump github.com/onsi/ginkgo/v2 in /src/notifications     Bumps [github.com/onsi/ginkgo/v2] (https://github.com/onsi/ginkgo) from 2.22.2 to 2.23.0.       - [Release notes] (https://github.com/onsi/ginkgo/releases)       - [Changelog] (https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md)       - [Commits] (https://github.com/onsi/ginkgo/compare/v2.22.2...v2.23.0)       ---       updated-dependencies:         - dependency-name: github.com/onsi/ginkgo/v2           dependency-type: direct:production           update-type: version-update:semver-minor           ...           Signed-off-by: dependabot[bot]           commit 0e1dd9e66238eb8ecd73b5a1d72bdf3e5230 c1b7           Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;           Date: Mon Mar 10 22:33:15 2025 +0000           Bump github.com/onsi/ginkgo/v2 from 2.22.2           to 2.23.0 in /src/acceptance             Bumps [github.com/onsi/ginkgo/v2] (https://github.com/onsi/ginkgo) from 2.22.2 to 2.23.0.               - [Release notes] (https://github.com/onsi/ginkgo/releases)               - [Changelog] (https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md)               - [Commits] (https://github.com/onsi/ginkgo/compare/v2.22.2...v2.23.0)               ---               updated-dependencies:                 - dependency-name: github.com/onsi/ginkgo/v2                   dependency-type: direct:production                   update-type: version-update:semver-minor                   ...                   Signed-off-by: dependabot[bot]                   commit 1accd9ca81612cc63b72f102fb27d608913b 402f                   Author: PCF Event Alerts Team CI                   Date: Tue Mar 4 20:31:00 2025 +0000                   bump-golang to v0.168.0                   commit cf7c94c13f4bcfe6fdb459bc5b076cc74587 9ec0                   Merge: da4251e 24d4663 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> Author: Benjamin Fuller Date: Tue Feb 25 14:37:09 2025 -0700 Merge pull request #89 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/go-sql-driver/mysql-1.9.0 Bump github.com/go-sql-driver/mysql from 1.8.1 to 1.9.0 in /src/notifications commit 24d4663f8c426b744d7c016dc6d2e5411e0d68ba Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date: Mon Feb 24 23:18:38 2025 +0000 Bump github.com/go-sql-driver/mysql in /src/notifications Bumps [github.com/go-sql-driver/mysql](https://github.com/go-sql-driver/mysql) (http://github.com/go-sql-driver/mysql) from 1.8.1 to 1.9.0. - [Release notes] (https://github.com/go-sql-driver/mysql/releases) - [Changelog] (https://github.com/go-sql-driver/mysql/blob/master/CHANGELOG.md) - [Commits] (https://github.com/go-sql-driver/mysql/compare/v1.8.1...v1.9.0) --- updated-dependencies: - dependency-name: github.com/go-sql-driver/mysql dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot] commit da4251e120bce996090dfffd8d358a442b7de4bc4 Merge: 1e75324 571fbcd Author: Benjamin Fuller Date: Tue Feb 18 14:39:05 2025 -0700 Merge pull request #88 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/PuerkitoBio/goquery-1.10.2 Bump github.com/PuerkitoBio/goquery from 1.10.1 to 1.10.2 in /src/notifications commit 571fbcd5e9d761d1e7e573964888541194775a87 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date: Mon Feb 17 22:36:52 2025 +0000 Bump github.com/PuerkitoBio/goquery in /src/notifications Bumps [github.com/PuerkitoBio/goquery](https://github.com/PuerkitoBio/goquery) (http://github.com/PuerkitoBio/goquery) from 1.10.1 to 1.10.2. - [Release notes] (https://github.com/PuerkitoBio/goquery/releases) - [Commits] (https://github.com/PuerkitoBio/goquery/compare/v1.10.1...v1.10.2) --- updated-dependencies: </pre> |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |         | <pre> - dependency-name: github.com/PuerkitoBio/g oquery dependency-type: direct:production update-type: version-update:semver-patch ... Signed-off-by: dependabot[bot] commit 1e7532443505127f75a05db977d472ecb7c1 1b42 Author: PCF Event Alerts Team CI Date:   Wed Feb 12 19:25:48 2025 +0000 bump-golang to v0.166.0 commit d17f2e0685092f6489c797f877fa836d2ab6 689a Author: PCF Event Alerts Team CI Date:   Tue Feb 4 17:17:14 2025 +0000 bump-golang to v0.164.0 </pre> |
| notifications-ui | 55.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| otel-collector   | 0.11.4  | <p>▼ v0.11.4</p> <pre> ## What's Changed * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/clo">https://github.com/clo</a> dfoundry/otel-collector-release/compare/v0.1 1.3...v0.11.4 </pre> <p>▼ v0.11.3</p> <pre> ## What's Changed * Bump packaged Golang to go1.23.7 **Full Changelog**: <a href="https://github.com/clo">https://github.com/clo</a> dfoundry/otel-collector-release/compare/v0.1 1.2...v0.11.3 </pre>                     |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.44  | <p>▼ v4.6.44</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.27.zip - php_buildpack-cached-cflinuxfs4-v4.6.27.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   ruby   3.0.5   cflinuxfs4     appdynamics   23.11.0-839   cflinuxfs4, cflinuxfs3     composer   2.8.7   cflinuxfs4, cflinuxfs3       httpd   2.4.63   cflinuxfs3, cflinuxfs4     newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4     nginx   1.26.3   cflinuxfs3, cflinuxfs4     nginx   1.27.4   cflinuxfs3, cflinuxfs4     php   8.1.31   cflinuxfs3, cflinuxfs4     php   8.1.32   cflinuxfs3, cflinuxfs4     php   8.2.26   cflinuxfs3, cflinuxfs4     php   8.2.28   cflinuxfs3, cflinuxfs4     php   8.3.14   cflinuxfs3, cflinuxfs4     php   8.3.19   cflinuxfs3, cflinuxfs4     python   3.12.4   cflinuxfs3, cflinuxfs4     ## Default Versions   Name   Version    - -    php   8.1.32     httpd   2.4.63     newrelic   10.21.0.11     nginx   1.27.4     composer   2.8.7   </pre> <p>▼ v4.6.43</p> <pre> Buildpacks provided by this bosh release: - php_buildpack-cached-cflinuxfs3-v4.6.26.zip - php_buildpack-cached-cflinuxfs4-v4.6.26.zip </pre> |

| <b>Component</b>           | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release  | 677.0.70       | <p>▼ 677.0.70</p> <pre>## What's Changed * add warnings and errors for user when tanzu License is close to expiring or expiring * split up process requests to capi to avoid overloading the nginx with a request with too many guids</pre> <p>▼ 677.0.69</p> <pre>- Enhance the visual design of apps manager away from the overly white contrast theme</pre>                                                                                                                                                                               |
| push-offline-docs-release  | 6.0.169        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| push-usage-service-release | 674.0.161      | <p>▼ v674.0.161</p> <pre>## Changes * Update to latest cve fixes * chore: remove unused kiln upload release * creating final release 674.0.160</pre> <p>▼ v674.0.160</p> <pre>## Changes * creating final release 674.0.159</pre> <p>▼ v674.0.159</p> <pre>## Changes * creating final release 674.0.158</pre>                                                                                                                                                                                                                               |
| pxc                        | 1.0.39         | <p>▼ v1.0.39</p> <pre>## Release Notes **Dependency bumps** - Percona XtraDB Cluster 5.7 support has been bumped to [v5.7.44-31.65-5] (<a href="https://docs.percona.com/percona-xtradb-cluster/5.7/release-notes/5.7.44-31.65.5.html">https://docs.percona.com/percona-xtradb-cluster/5.7/release-notes/5.7.44-31.65.5.html</a>) - pxc-release components now build with [Go v1.24.2] (<a href="https://go.dev/doc/devel/release#go1.24.minor">https://go.dev/doc/devel/release#go1.24.minor</a>) - Updates packages and dependencies</pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.51  | <p>▼ v1.8.51</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.3 9.zip - python_buildpack-cached-cflinuxfs4-v1.8.3 9.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.21   cflinuxfs3, cflinuxfs4     python   3.10.16   cflinuxfs3, cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.2   cflinuxfs3, cflinuxfs4     setuptools   78.1.0   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> <p>▼ v1.8.50</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.3 8.zip - python_buildpack-cached-cflinuxfs4-v1.8.3 8.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    libmemcache   1.0.18   cflinuxfs4, cflinuxfs3     miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.21   cflinuxfs3, cflinuxfs4     python   3.10.16   cflinuxfs3, cflinuxfs4     </pre> |

| Component | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |           | <pre>   python   3.11.11   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.2   cflinuxfs3, cflinuxfs4     setuptools   76.0.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|           | ▼ v1.8.49 | <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.3 7.zip - python_buildpack-cached-cflinuxfs4-v1.8.3 7.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.21   cflinuxfs3, cflinuxfs4     python   3.10.16   cflinuxfs3, cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.2   cflinuxfs3, cflinuxfs4       setuptools   76.0.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> |
|           | ▼ v1.8.48 | <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.3 7.zip - python_buildpack-cached-cflinuxfs4-v1.8.3 7.zip </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> 7.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    miniforge   24.7.1   cflinuxfs4, cflinuxfs3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs4     python   3.9.21   cflinuxfs3, cflinuxfs4     python   3.10.16   cflinuxfs3, cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.2   cflinuxfs3, cflinuxfs4     setuptools   76.0.0   cflinuxfs4, cflinuxfs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| r-offline-buildpack | 1.2.37  | <p>▼ v1.2.37</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.20.zip - r_buildpack-cached-cflinuxfs4-v1.2.20.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre> |
|                     |         | <p>▼ v1.2.36</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.19.zip - r_buildpack-cached-cflinuxfs4-v1.2.19.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre> |
|                     |         | <p>▼ v1.2.35</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.18.zip - r_buildpack-cached-cflinuxfs4-v1.2.18.zip ## Packaged Binaries   Name   Version   CF Stacks    - -    r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - - </pre> |
|                     |         | <p>▼ v1.2.34</p> <pre>Buildpacks provided by this bosh release: - r_buildpack-cached-cflinuxfs3-v1.2.18.zip - r_buildpack-cached-cflinuxfs4-v1.2.18.zip ## Packaged Binaries   Name   Version   CF Stacks    - - </pre>                                                                                                                                                                   |

| Component | Version | Release Notes                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  r   4.2.3   cflinuxfs3, cflinuxfs4     r   4.3.3   cflinuxfs3, cflinuxfs4     r   4.4.1   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version     -   -  </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.334.0 | <p>▼ v0.334.0</p> <pre> ## 0.334.0 **Release Date**: March 31, 2025 ## Changes - feat: Introduce switch for envelope v1 metrics - <a href="https://github.com/cloudfoundry/routing-release/pull/456">https://github.com/cloudfoundry/routing-release/pull/456</a> - Thanks @b1tamara and @mike-jc ! - revert fix for race condition now that race condition does not exist - <a href="https://github.com/cloudfoundry/gorouter/pull/469">https://github.com/cloudfoundry/gorouter/pull/469</a> - This change + Go 1.24 changes how 1XX responses are handled. This might affect users: [Transport] (<a href="https://tip.golang.org/pkg/net/http#Transport">https://tip.golang.org/pkg/net/http#Transport</a>)'s limit on 1xx informational responses received in response to a request has changed. It previously aborted a request and returned an error after receiving more than 5 1xx responses. It now returns an error if the total size of all 1xx responses exceeds the [Transport.MaxResponseHeaderBytes] (<a href="https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes">https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes</a>) configuration setting. ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 1feb42f7..d373561e 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -76,8 +76,14 @@ properties: description: "TLS Certificate used for the TLS listener of the LB healthcheck endpoint" router.status.tls.key: description: "Private Key used for the TLS listener of the LB healthcheck endpoint" + router.enable_envelope_v1_metrics: +   description: "Enables support for metrics reported via Envelope." +   default: true router.prometheus.port: -   description: "Port for the prometheus endpoint." +   description: "Port for the prometheus endpoint. Automatically enables Prometheus support." + router.prometheus.enable_scraper: +   description: "Activate the Prometheus scraper to collect metrics from the gorouter." +   default: true router.prometheus.server_name: description: "The server name used in the certificate for the metrics endpoint." router.prometheus.ca_cert: @@ -89,6 +95,18 @@ properties: </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> router.prometheus.key:   description: "TLS private key for prometheus server."   default: ""   + router.prometheus.meters.route_lookup_time_histogram_buckets:     + description: "Upper limits in nanoseconds of the ranges in which the observed value of route lookup time is expected to fall"       + default: [10000, 20000, 30000, 40000, 50000, 60000, 70000, 80000, 90000, 100000]       + router.prometheus.meters.route_registration_latency_histogram_buckets:         + description: "Upper limits in milliseconds of the ranges in which the observed value of route registration latency is expected to fall"           + default: [0.1, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4]         + router.prometheus.meters.routing_response_latency_histogram_buckets:           + description: "Upper limits in milliseconds of the ranges in which the observed value of route response latency is expected to fall"             + default: [1, 2, 4, 6, 8, 10, 20, 40, 50, 100, 500, 1000]           + router.prometheus.meters.http_latency_histogram_buckets:             + description: "Upper limits in seconds of the ranges in which the observed value of the latency of http requests from gorouter and back"               + default: [0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, 12.8, 25.6]             router.requested_route_registration_interval_in_seconds:               description:                   On startup, the router will delay listening for requests by this duration to increase likelihood that it has a complete routing table before serving requests.               ...               ## Built with go 1.24.1               **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.333.0...v0.334.0">https://github.com/cloudfoundry/routing-release/compare/v0.333.0...v0.334.0</a>               ## Resources               - [Download release 0.334.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.334.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.334.0</a>). </pre> <p>▼ v0.333.0</p> <div style="border: 1px solid #ccc; padding: 5px;"> <pre> ## 0.333.0 **Release Date**: March 24, 2025 ## Changes </pre> </div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>- Upgrade go to 1.24!</li> <li>- <math>\Delta</math> Minor Go bumps often cause some turbulence with routing-release. You can read the full go 1.24 release [notes here] (<a href="https://tip.golang.org/doc/go1.24">https://tip.golang.org/doc/go1.24</a>).</li> <li>- <math>\Delta</math> Go 1.24 changes how 1XX responses are handled. This might affect users: <ul style="list-style-type: none"> <li>&gt; [Transport] (<a href="https://tip.golang.org/pkg/net/http#Transport">https://tip.golang.org/pkg/net/http#Transport</a>)'s limit on 1xx informational responses received in response to a request has changed. It previously aborted a request and returned an error after receiving more than 5 1xx responses. It now returns an error if the total size of all 1xx responses exceeds the [Transport.MaxResponseHeaderBytes] (<a href="https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes">https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes</a>) configuration setting.</li> </ul> </li> <li>## Bosh Job Spec changes:</li> <pre>```diff diff --git a/jobs/acceptance_tests/spec b/jobs/acceptance_tests/spec index 51a81762..109e7e3f 100644 --- a/jobs/acceptance_tests/spec +++ b/jobs/acceptance_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: -- golang-1.23-linux + - golang-1.24-linux - acceptance_tests - rtr - cf-cli-8-linux diff --git a/jobs/smoke_tests/spec b/jobs/smoke_tests/spec index 4ea8eb07..1260ab4f 100644 --- a/jobs/smoke_tests/spec +++ b/jobs/smoke_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: -- golang-1.23-linux + - golang-1.24-linux - acceptance_tests - cf-cli-8-linux ``` </pre> <li>## Built with go 1.24.1</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.332.0...v0.333.0">https://github.com/cloudfoundry/routing-release/compare/v0.332.0...v0.333.0</a></li> <li>## Resources</li> <li>- [Download release 0.333.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.333.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.333.0</a>).</li> </ul> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack    | 1.10.38 | <p>▼ v1.10.38</p> <pre> Buildpacks provided by this bosh release: - ruby_buildpack-cached-cflinuxfs3-v1.10.2 4.zip - ruby_buildpack-cached-cflinuxfs4-v1.10.2 4.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   yarn   1.22.22   cflinuxfs4, cflinuxfs3     bundler   2.6.7   cflinuxfs4, cflinuxfs3       jruby   9.4.8.0   cflinuxfs3, cflinuxfs4       node   20.16.0   cflinuxfs3     node   22.14.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.6   cflinuxfs3, cflinuxfs4     ruby   3.1.7   cflinuxfs3, cflinuxfs4     ruby   3.2.5   cflinuxfs3, cflinuxfs4     ruby   3.2.7   cflinuxfs3, cflinuxfs4     ruby   3.3.6   cflinuxfs3, cflinuxfs4     ruby   3.3.7   cflinuxfs3, cflinuxfs4     rubygems   3.6.7   cflinuxfs4, cflinuxfs3     ## Default Versions   Name   Version    - -    ruby   3.2.x   </pre> |
| web-servers-cnb-buildpack | 0.15.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.69.0  | <p>▼ v3.69.0</p> <pre> ## 3.69.0 **Release Date**: April 02, 2025 ## Changes - Adds the ability to configure the HTTP client-side timeout used when vxlan-policy-agent is talking to policy-server for ASG + C2C network policy information. - Updates the default HTTP client-side timeout from 5s, to 30s.  ## Bosh Job Spec changes: ```diff diff --git a/jobs/vxlan-policy-agent/spec b/jobs/vxlan-policy-agent/spec index 802f04bb..430009c6 100644 --- a/jobs/vxlan-policy-agent/spec +++ b/jobs/vxlan-policy-agent/spec @@ -52,6 +52,10 @@ properties: description: "The VXLAN policy agent queries the policy server on this interval in seconds and updates local policy rules." default: 5 + client_timeout_seconds: +   description: "Timeout to use for HTTP connections to policy_server" +   default: 30 + enable_asg_syncing: description: "Enable dynamic updates to ASG rules for running containers" default: true ``` ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.68.0...v3.69.0">https://github.com/cloudfoundry/silk-release/compare/v3.68.0...v3.69.0</a>  ## Resources - [Download release 3.69.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.69.0). </pre> <p>▼ v3.68.0</p> <pre> ## 3.68.0 **Release Date**: March 24, 2025 ## Changes - Bump to golang 1.24.1 from 1.23.x - vxlan-policy-agent now only syncs ASG data if it has changed since the last polling interval.  ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.67.0...v3.68.0">https://github.com/cloudfoundry/silk-release/compare/v3.67.0...v3.68.0</a>  ## Resources </pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |         | <ul style="list-style-type: none"> <li>- [Download release 3.68.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.68.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.68.0</a>).</li> </ul> <p>▼ v3.67.0</p> <pre>## 3.67.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.66.0...v3.67.0">https://github.com/cloudfoundry/silk-release/compare/v3.66.0...v3.67.0</a> ## Resources - [Download release 3.67.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.67.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.67.0</a>).</pre>                                                                                                                                                                                                                                                                                                                         |
| smb-volume  | 3.24.0  | <p>▼ v3.24.0</p> <pre>## 3.24.0 **Release Date**: March 24, 2025 ## Changes - Bump dependancies ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.23.0...v3.24.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.23.0...v3.24.0</a> ## Resources - [Download release 3.24.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.24.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.24.0</a>).</pre> <p>▼ v3.23.0</p> <pre>## 3.23.0 **Release Date**: March 21, 2025 ## Changes - dependency bumps ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.22.0...v3.23.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.22.0...v3.23.0</a> ## Resources - [Download release 3.23.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.23.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.23.0</a>).</pre> |
| smoke-tests | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                           |
|------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.8.31  | <p>▼ v1.8.31</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v1.6.28.zip - staticfile_buildpack-cached-cflinuxfs4-v1.6.28.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |
|                              |         | <p>▼ v1.8.30</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v1.6.27.zip - staticfile_buildpack-cached-cflinuxfs4-v1.6.27.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |
|                              |         | <p>▼ v1.8.29</p> <pre>Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v1.6.26.zip - staticfile_buildpack-cached-cflinuxfs4-v1.6.26.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -    nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    nginx   1.27.x  </pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| statsd-injector        | 1.11.48 | <p>▼ v1.11.48</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/statsd-injector-release/compare/v1.11.47...v1.11.48">https://github.com/cloudfoundry/statsd-injector-release/compare/v1.11.47...v1.11.48</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| syslog                 | 12.3.9  | <p>▼ v12.3.9</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.8...v12.3.9">https://github.com/cloudfoundry/syslog-release/compare/v12.3.8...v12.3.9</a></pre> <p>▼ v12.3.8</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Golang to go1.23.7 ## New Contributors * @schmidtsv made their first contribution in <a href="https://github.com/cloudfoundry/syslog-release/pull/207">https://github.com/cloudfoundry/syslog-release/pull/207</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.7...v12.3.8">https://github.com/cloudfoundry/syslog-release/compare/v12.3.7...v12.3.8</a></pre> |
| system-metrics-scraper | 4.0.18  | <p>▼ v4.0.18</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.17...v4.0.18">https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.17...v4.0.18</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| uaa                    | 77.20.4 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| tanzu-jammy-stack      | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 6.0.14

**Release Date:** 03/25/2025

- **[Feature]** Gorouter respects new `X-CF-PROCESS-INSTANCE` header for routing to specific app processes, especially helpful for testing canary deployments. See [these docs](#) for more information.
- **[Feature Improvement]** Canary deployments support a new `--instance-steps` flag that allows for fine-grained control over a canary deployment rollout. See [these docs](#) for more information.
- Bump binary-offline-buildpack to version `1.1.34`
- Bump capi to version `1.205.0`
- Bump cf-autoscaling to version `250.4.3`
- Bump cf-networking to version `3.67.0`
- Bump cflinuxfs3 to version `0.620.0`
- Bump cflinuxfs4 to version `1.291.0`
- Bump credhub to version `2.12.108`
- Bump dotnet-core-offline-buildpack to version `2.4.52`
- Bump go-offline-buildpack to version `1.10.48`
- Bump java-offline-buildpack to version `4.81.0`
- Bump nginx-offline-buildpack to version `1.2.38`
- Bump nodejs-offline-buildpack to version `1.8.52`
- Bump notifications-ui to version `55.0.0`
- Bump php-offline-buildpack to version `4.6.41`
- Bump push-apps-manager-release to version `677.0.68`
- Bump push-usage-service-release to version `674.0.158`
- Bump pxc to version `1.0.38`
- Bump python-offline-buildpack to version `1.8.47`
- Bump r-offline-buildpack to version `1.2.33`
- Bump routing to version `0.332.0`
- Bump ruby-offline-buildpack to version `1.10.37`
- Bump staticfile-offline-buildpack to version `1.8.28`
- Bump uaa to version `77.20.4`

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs component since the previous patch version of TAS for VMs:

| Component | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| capi      | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-24538</a> (critical)</li> <li>• <a href="#">CVE-2021-38297</a> (critical)</li> <li>• <a href="#">CVE-2023-24531</a> (critical)</li> <li>• <a href="#">CVE-2023-29404</a> (critical)</li> <li>• <a href="#">CVE-2023-29402</a> (critical)</li> <li>• <a href="#">CVE-2023-24540</a> (critical)</li> <li>• <a href="#">CVE-2024-24790</a> (critical)</li> <li>• <a href="#">CVE-2023-29405</a> (critical)</li> <li>• <a href="#">CVE-2022-23806</a> (critical)</li> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2023-39323</a> (high)</li> <li>• <a href="#">CVE-2023-29403</a> (high)</li> <li>• <a href="#">CVE-2022-30580</a> (high)</li> <li>• <a href="#">CVE-2022-24921</a> (high)</li> <li>• <a href="#">CVE-2022-28327</a> (high)</li> <li>• <a href="#">CVE-2023-24537</a> (high)</li> <li>• <a href="#">CVE-2024-34156</a> (high)</li> <li>• <a href="#">CVE-2023-45283</a> (high)</li> <li>• <a href="#">CVE-2024-24791</a> (high)</li> <li>• <a href="#">GHSA-7wqh-767x-r66v</a> (high)</li> <li>• <a href="#">CVE-2022-41725</a> (high)</li> <li>• <a href="#">CVE-2024-34158</a> (high)</li> <li>• <a href="#">CVE-2021-44716</a> (high)</li> <li>• <a href="#">CVE-2022-30635</a> (high)</li> <li>• <a href="#">CVE-2022-23773</a> (high)</li> <li>• <a href="#">CVE-2022-41724</a> (high)</li> <li>• <a href="#">CVE-2022-29804</a> (high)</li> <li>• <a href="#">CVE-2023-45285</a> (high)</li> <li>• <a href="#">CVE-2022-41720</a> (high)</li> <li>• <a href="#">CVE-2022-30632</a> (high)</li> <li>• <a href="#">CVE-2023-45288</a> (high)</li> <li>• <a href="#">CVE-2022-2880</a> (high)</li> <li>• <a href="#">CVE-2022-41722</a> (high)</li> <li>• <a href="#">CVE-2022-41723</a> (high)</li> <li>• <a href="#">CVE-2023-44487</a> (high)</li> <li>• <a href="#">CVE-2022-41715</a> (high)</li> <li>• <a href="#">CVE-2023-24536</a> (high)</li> <li>• <a href="#">CVE-2023-45287</a> (high)</li> </ul> |

| Component | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2021-41772</a> (high)</li> <li>• <a href="#">CVE-2021-41771</a> (high)</li> <li>• <a href="#">CVE-2021-39293</a> (high)</li> <li>• <a href="#">CVE-2022-30633</a> (high)</li> <li>• <a href="#">CVE-2022-28131</a> (high)</li> <li>• <a href="#">CVE-2022-41716</a> (high)</li> <li>• <a href="#">CVE-2023-24534</a> (high)</li> <li>• <a href="#">CVE-2022-30634</a> (high)</li> <li>• <a href="#">CVE-2022-32189</a> (high)</li> <li>• <a href="#">CVE-2022-27664</a> (high)</li> <li>• <a href="#">CVE-2022-30631</a> (high)</li> <li>• <a href="#">CVE-2024-24784</a> (high)</li> <li>• <a href="#">CVE-2022-23772</a> (high)</li> <li>• <a href="#">CVE-2022-30630</a> (high)</li> <li>• <a href="#">CVE-2022-24675</a> (high)</li> <li>• <a href="#">CVE-2022-2879</a> (high)</li> <li>• <a href="#">CVE-2023-24539</a> (high)</li> <li>• <a href="#">CVE-2023-29400</a> (high)</li> <li>• <a href="#">CVE-2022-1705</a> (medium)</li> <li>• <a href="#">CVE-2023-45290</a> (medium)</li> <li>• <a href="#">CVE-2022-32148</a> (medium)</li> <li>• <a href="#">CVE-2023-29406</a> (medium)</li> <li>• <a href="#">CVE-2024-24787</a> (medium)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2023-39318</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">CVE-2023-39319</a> (medium)</li> <li>• <a href="#">GHSA-8cgq-6mh2-7j6v</a> (medium)</li> <li>• <a href="#">CVE-2024-24783</a> (medium)</li> <li>• <a href="#">CVE-2024-24789</a> (medium)</li> <li>• <a href="#">CVE-2022-1962</a> (medium)</li> <li>• <a href="#">CVE-2024-24785</a> (medium)</li> <li>• <a href="#">CVE-2022-41717</a> (medium)</li> <li>• <a href="#">CVE-2023-24532</a> (medium)</li> <li>• <a href="#">CVE-2022-29526</a> (medium)</li> <li>• <a href="#">CVE-2023-45284</a> (medium)</li> <li>• <a href="#">CVE-2023-39326</a> (medium)</li> <li>• <a href="#">CVE-2023-29409</a> (medium)</li> </ul> |

| Component        | Vulnerabilities Resolved                                                                                                                                                                                                                                                                               |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2021-44717</a> (medium)</li> <li>• <a href="#">CVE-2023-45289</a> (medium)</li> <li>• <a href="#">CVE-2024-34155</a> (medium)</li> <li>• <a href="#">CVE-2022-30629</a> (low)</li> <li>• <a href="#">GHSA-vvfq-8hwr-qm4m</a> (low)</li> </ul> |
| cf-autoscaling   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> </ul>                                                                                                                                                                                                              |
| cf-networking    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> </ul>                                                                                                                                                                                                              |
| credhub          | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-83qj-6fr2-vhqg</a> (critical)</li> </ul>                                                                                                                                                                                                     |
| notifications-ui | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> </ul>                                                                                                        |

## Component Release Notes

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ubuntu-jammy stemcell    | 1.785   |                                                                                                                                                                                                                                                                                                                                                                                                            |
| backup-and-restore-sdk   | 1.19.45 |                                                                                                                                                                                                                                                                                                                                                                                                            |
| binary-offline-buildpack | 1.1.34  | <p>▼ v1.1.33</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre> Buildpacks provided by this bosh release: - binary_buildpack-cached-cflinuxfs3-v1.1.1 6.zip - binary_buildpack-cached-cflinuxfs4-v1.1.1 6.zip - binary_buildpack-cached-windows-v1.1.16.z ip  ## Packaged Binaries   Name   Version   CF Stacks     -   -   -   ## Default Versions   Name   Version     -   -   </pre> </div> |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                            |
| bpm                      | 1.4.16  |                                                                                                                                                                                                                                                                                                                                                                                                            |
| capi                     | 1.205.0 |                                                                                                                                                                                                                                                                                                                                                                                                            |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-autoscaling        | 250.4.3 | <p>▼ v250.4.3</p> <pre>## What's Changed * Bump Golang dependencies * Bump JDK: OpenJDK17U 17.0.13_11 -&gt; 17.0.1 4_7</pre> <p>▼ v250.4.2</p> <pre>## What's Changed * Bump GoLang dependencies * Revert Java dependency bumps * ~autoscaler api failing to install on internetless, which may be java bumps or packaging change~ * investigation found java buildpack bug caused the issue; will replace the dependency bumps next release</pre>                                                |
| cf-cli                | 1.68.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| cf-networking         | 3.67.0  | <p>▼ v3.67.0</p> <pre>## 3.67.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies - Use capi v3 endpoints. Thanks https://github.com/cloudfoundry/cf-networking-release/pull/316 @winkingturtle-vmw ## Built with go 1.23.7 **Full Changelog**: https://github.com/cloudfoundry/cf-networking-release/compare/v3.66.0...v3.67.0 ## Resources - [Download release 3.67.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.67.0).</pre> |
| cflinuxfs3            | 0.620.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| cflinuxfs4            | 1.291.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component                     | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub                       | 2.12.108 | <p>▼ 2.12.108</p> <pre>## What's Changed * Build(deps): Bump json from 2.10.1 to 2.1 0.2 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/299 * Build(deps): Bump rubocop from 1.73.2 to 1.74.0 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/300 * Build(deps): Bump rubocop-ast from 1.38.1 to 1.39.0 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/301 * Build(deps): Bump rubocop-ast from 1.39.0 to 1.40.0 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/302 * Build(deps): Bump ast from 2.4.2 to 2.4.3 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/303 * Build(deps): Bump parser from 3.3.7.1 to 3.3.7.2 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/304 **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.107...2.12.108">https://github.com/pivotal/credhub-release/compare/2.12.107...2.12.108</a></pre> <p>▼ 2.12.107</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.106...2.12.107">https://github.com/pivotal/credhub-release/compare/2.12.106...2.12.107</a></pre> <p>▼ 2.12.106</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.105...2.12.106">https://github.com/pivotal/credhub-release/compare/2.12.105...2.12.106</a></pre> |
| diego                         | 2.105.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| dotnet-core-offline-buildpack | 2.4.52   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| garden-runc                   | 1.70.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component            | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| go-offline-buildpack | 1.10.48 | <p>▼ v1.10.48</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.31.zip - go_buildpack-cached-cflinuxfs4-v1.10.31.zip  ## Packaged Binaries   Name   Version   CF Stacks    - - -   dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.7   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> |
|                      |         | <p>▼ v1.10.47</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.31.zip - go_buildpack-cached-cflinuxfs4-v1.10.31.zip  ## Packaged Binaries   Name   Version   CF Stacks    - - -   dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.7   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> |
|                      |         | <p>▼ v1.10.46</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.31.zip - go_buildpack-cached-cflinuxfs4-v1.10.31.zip  ## Packaged Binaries   Name   Version   CF Stacks    - - -   dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.12   cflinuxfs3, cflinuxfs4     go   1.23.7   cflinuxfs3, cflinuxfs4  </pre>                                                                                                      |

| Component                       | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |          | <pre>  godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> <p>▼ v1.10.45</p> <pre>Buildpacks provided by this bosh release: * go_buildpack-cached-cflinuxfs3-v1.10.31.zip * go_buildpack-cached-cflinuxfs4-v1.10.31.zip</pre> <p>▼ v1.10.44</p> <pre>Buildpacks provided by this bosh release: - go_buildpack-cached-cflinuxfs3-v1.10.30.zip - go_buildpack-cached-cflinuxfs4-v1.10.30.zip  ## Packaged Binaries   Name   Version   CF Stacks    - -    dep   0.5.4   cflinuxfs3, cflinuxfs4     glide   0.13.3   cflinuxfs3, cflinuxfs4     go   1.22.10   cflinuxfs3, cflinuxfs4     go   1.23.4   cflinuxfs3, cflinuxfs4     godep   80   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -    go   1.22.x  </pre> |
| java-offline-buildpack          | 4.81.0   | <p>▼ v4.81.0</p> <pre>v4.81.0 https://usw1.packages.broadcom.com/artifactory/tanzu-build-generic-prod-local/java-offline-buildpack-release/java-offline-buildpack-4.81.0.tgz SHA256 checksum: 49bec2b42de9038182d536dc692230bb78c2bea6c569404ee5935663ab0918fe</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| java-native-image-cnb-buildpack | 0.11.22  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| log-cache                       | 3.1.9    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| loggregator                     | 107.0.20 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| loggregator-agent               | 8.3.5    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| <b>Component</b>        | <b>Version</b> | <b>Release Notes</b> |
|-------------------------|----------------|----------------------|
| metric-registrar        | 4.0.6          |                      |
| mysql-monitoring        | 10.22.0        |                      |
| nats                    | 56.41.0        |                      |
| nfs-volume              | 7.23.0         |                      |
| nginx-offline-buildpack | 1.2.38         |                      |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.52  | <p>▼ v1.8.52</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3 5.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3 5.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   python   3.11.11   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs4, cflinuxfs3     node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.2   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    - -   node   18.x     python   3.11.x   </pre> <p>▼ v1.8.51</p> <pre> Buildpacks provided by this bosh release: - nodejs_buildpack-cached-cflinuxfs3-v1.8.3 5.zip - nodejs_buildpack-cached-cflinuxfs4-v1.8.3 5.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   python   3.11.11   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs4, cflinuxfs3     node   18.20.6   cflinuxfs3, cflinuxfs4     node   18.20.7   cflinuxfs3, cflinuxfs4     node   20.18.2   cflinuxfs3, cflinuxfs4     node   20.18.3   cflinuxfs3, cflinuxfs4     node   22.13.1   cflinuxfs4     node   22.14.0   cflinuxfs4   ## Default Versions   Name   Version    - -   node   18.x     python   3.11.x   </pre> |
| notifications            | 77.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications-ui           | 55.0.0    | <p>▼ v55.0.0</p> <ul style="list-style-type: none"> <li>* fix notifications-ui deploy to not break on upgrades</li> <li>* update golang</li> <li>* update dependencies</li> </ul> <p>▼ v54.0.0</p> <ul style="list-style-type: none"> <li>* update golang</li> </ul> <p>▼ v53.0.0</p> <ul style="list-style-type: none"> <li>* update jq</li> </ul> <p>▼ v52.0.0</p> <ul style="list-style-type: none"> <li>* update dependencies</li> </ul> |
| otel-collector             | 0.11.2    |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| php-offline-buildpack      | 4.6.41    |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| push-apps-manager-release  | 677.0.68  | <p>▼ 677.0.68</p> <ul style="list-style-type: none"> <li>* update apps-manager to be compatible with the new http tracing endpoint. httpexchanges is the new name for httptrace. This should make apps-manager compliant with spring 3.0</li> <li>* update dependencies</li> </ul>                                                                                                                                                           |
| push-offline-docs-release  | 6.0.169   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| push-usage-service-release | 674.0.158 | <p>▼ v674.0.158</p> <ul style="list-style-type: none"> <li>## Changes</li> <li>* creating final release 674.0.157</li> </ul> <p>▼ v674.0.157</p> <ul style="list-style-type: none"> <li>## Changes</li> <li>* creating final release 674.0.156</li> </ul>                                                                                                                                                                                    |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pxc       | 1.0.38  | <p>▼ v1.0.38</p> <div style="border: 1px solid black; padding: 10px;"><pre>## Release Notes **New Features** - The pxc-mysql pre-start check to verify whether a deployment is using a persistent disk may now be disabled by setting [disable_persistent_storage_safety_check] (<a href="https://github.com/cloudfoundry/pxc-release/blob/86227a9dde716df41dc7e820745f826ac6af6a57/jobs/pxc-mysql/spec#L72">https://github.com/cloudfoundry/pxc-release/blob/86227a9dde716df41dc7e820745f826ac6af6a57/jobs/pxc-mysql/spec#L72</a>) to true  **Dependency bumps** - Percona XtraDB Cluster has been bumped to [v8.0.41-32] (<a href="https://docs.percona.com/percona-xtradb-cluster/8.0/release-notes/8.0.41-32.html">https://docs.percona.com/percona-xtradb-cluster/8.0/release-notes/8.0.41-32.html</a>) - pxc-release components now build with [Go v1.24.1] (<a href="https://go.dev/doc/devel/release#go1.24.minor">https://go.dev/doc/devel/release#go1.24.minor</a>) - Updates packages and dependencies</pre></div> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.47  | <p>▼ v1.8.47</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.3 6.zip - python_buildpack-cached-cflinuxfs4-v1.8.3 6.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.21   cflinuxfs3, cflinuxfs4     python   3.10.16   cflinuxfs3, cflinuxfs4     python   3.11.11   cflinuxfs3, cflinuxfs4     python   3.12.9   cflinuxfs3, cflinuxfs4     python   3.13.2   cflinuxfs3, cflinuxfs4     setuptools   76.0.0   cflinuxfs4, cflinux fs3     libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3     miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x   </pre> <p>▼ v1.8.45</p> <pre> Buildpacks provided by this bosh release: - python_buildpack-cached-cflinuxfs3-v1.8.3 4.zip - python_buildpack-cached-cflinuxfs4-v1.8.3 4.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   libffi   3.2.1   cflinuxfs4, cflinuxfs3     libmemcache   1.0.18   cflinuxfs4, cflinu xfs3     miniforge   24.7.1   cflinuxfs4, cflinuxf s3     pip   25.0.1   cflinuxfs4, cflinuxfs3     pipenv   2024.4.1   cflinuxfs3, cflinuxfs 4     python   3.9.21   cflinuxfs3, cflinuxfs4     python   3.10.16   cflinuxfs3, cflinuxfs4 </pre> |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                  |
|---------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |         | <pre>  python   3.11.11   cflinuxfs3, cflinuxfs4   python   3.12.9   cflinuxfs3, cflinuxfs4   python   3.13.2   cflinuxfs3, cflinuxfs4   setuptools   76.0.0   cflinuxfs4, cflinuxfs3   ## Default Versions   Name   Version    - -    python   3.10.x  </pre> |
| r-offline-buildpack | 1.2.33  |                                                                                                                                                                                                                                                                |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing                   | 0.332.0 | <p>▼ v0.332.0</p> <pre> ## 0.332.0 **Release Date**: March 20, 2025 ## Changes - In-line submodules - <a href="https://github.com/cloudfoundry/routing-release/pull/457">https://github.com/cloudfoundry/routing-release/pull/457</a> - thank you @maxmoehl ! - move timing info to extra access log fields logic - <a href="https://github.com/cloudfoundry/routing-release/pull/455">https://github.com/cloudfoundry/routing-release/pull/455</a> - thank you @maxmoehl ! - Add routing via X-CF-PROCESS-INSTANCE - <a href="https://github.com/cloudfoundry/gorouter/pull/467">https://github.com/cloudfoundry/gorouter/pull/467</a> - Thanks @ameowlia ! ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 9d694a02..1feb42f7 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -328,7 +328,7 @@ properties: this property and operators have to explicitly enable them. This is done to prevent breaking log parsing in existing setups by the introduction of new fields. Does not affect stdout / stderr logs. - Available fields are: local_address + Available fields are: backend_time, dial_time, dns_time, failed_attempts, failed_attempts_time, local_address, tls_time default: [] router.logging.format.timestamp: description:   ``` ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.331.0...v0.332.0">https://github.com/cloudfoundry/routing-release/compare/v0.331.0...v0.332.0</a> ## Resources - [Download release 0.332.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.332.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.332.0</a>). </pre> |
| ruby-offline-buildpack    | 1.10.37 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| web-servers-cnb-buildpack | 0.15.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| silk                      | 3.66.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| smb-volume                | 3.22.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| staticfile-offline-buildpack | 1.8.28  | <p>▼ v1.8.27</p> <pre> Buildpacks provided by this bosh release: - staticfile_buildpack-cached-cflinuxfs3-v 1.6.25.zip - staticfile_buildpack-cached-cflinuxfs4-v 1.6.25.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   nginx   1.27.4   cflinuxfs3, cflinuxfs4   ## Default Versions   Name   Version    - -   nginx   1.27.x   </pre>                                                                                                                                                                                                                                                                                                       |
| statsd-injector              | 1.11.47 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| syslog                       | 12.3.7  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| system-metrics-scraper       | 4.0.17  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| uaa                          | 77.20.4 | <p>▼ v77.20.4</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.20.4] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.20.4">https://github.com/cloudfoundry/uaa/releases/tag/v77.20.4</a>)   * [Upgrade Tomcat to version 9.0.102] (<a href="https://github.com/cloudfoundry/uaa-release/commit/1190fe50b7a15fa9d2c8056670e28eed4adf8198">https://github.com/cloudfoundry/uaa-release/commit/1190fe50b7a15fa9d2c8056670e28eed4adf8198</a>)     **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.20.3...v77.20.4">https://github.com/cloudfoundry/uaa-release/compare/v77.20.3...v77.20.4</a> </pre> |
| tanzu-jammy-stack            | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## 6.0.13

**Release Date:** 03/11/2025

- **[Feature]** Operators can now “Enable comma-delimited lists of IPs for application security group (ASG) destinations” via the property in the “Networking” tab. **WARNING:** for foundations with the NSX-T tile installed, you **MUST** deploy NSX-T tile version 9.0.0 in policy mode before enabling this feature.
- **[Feature Improvement]** Operators can now let Puma auto-configure the number of workers based on the number of available cores.
- **[Feature Improvement]** Remove the need to track mapfs-release

- **[Feature Improvement]:** Backport GA OpenTelemetry Collector
- **[Bug Fix]** SMB Broker now supports all the mount parameters that the SMB Driver does ('sec', 'dir\_mode', 'file\_mode' were missing)
- Bump backup-and-restore-sdk to version [1.19.45](#)
- Bump binary-offline-buildpack to version [1.1.32](#)
- Bump bpm to version [1.4.16](#)
- Bump capi to version [1.203.0](#)
- Bump cf-autoscaling to version [250.4.1](#)
- Bump cf-networking to version [3.66.0](#)
- Bump cflinuxfs3 to version [0.618.0](#)
- Bump cflinuxfs4 to version [1.288.0](#)
- Bump credhub to version [2.12.105](#)
- Bump dotnet-core-offline-buildpack to version [2.4.51](#)
- Bump garden-runc to version [1.70.0](#)
- Bump go-offline-buildpack to version [1.10.43](#)
- Bump java-offline-buildpack to version [4.80.0](#)
- Bump log-cache to version [3.1.9](#)
- Bump loggregator to version [107.0.20](#)
- Bump loggregator-agent to version [8.3.5](#)
- Bump mysql-monitoring to version [10.22.0](#)
- Bump nats to version [56.41.0](#)
- Bump nfs-volume to version [7.23.0](#)
- Bump nginx-offline-buildpack to version [1.2.37](#)
- Bump nodejs-offline-buildpack to version [1.8.49](#)
- Bump php-offline-buildpack to version [4.6.40](#)
- Bump push-apps-manager-release to version [677.0.67](#)
- Bump push-usage-service-release to version [674.0.156](#)
- Bump pxc to version [1.0.37](#)
- Bump python-offline-buildpack to version [1.8.44](#)
- Bump r-offline-buildpack to version [1.2.32](#)
- Bump routing to version [0.331.0](#)
- Bump ruby-offline-buildpack to version [1.10.36](#)
- Bump silk to version [3.66.0](#)

- Bump smb-volume to version 3.22.0
- Bump staticfile-offline-buildpack to version 1.8.26
- Bump statsd-injector to version 1.11.47
- Bump syslog to version 12.3.7
- Bump system-metrics-scraper to version 4.0.17
- Bump uaa to version 77.20.3

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs component since the previous patch version of TAS for VMs:

| Component                 | Vulnerabilities Resolved                                                                                                                                                         |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub                   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-21502</a></li> <li>• <a href="#">GHSA-4g8c-wm8x-jfhw</a></li> <li>• <a href="#">GHSA-389x-839f-4rhx</a></li> </ul> |
| cflinuxfs4                | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>           |
| nats                      | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>           |
| capi                      | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-7g2v-jj9q-g3rg</a></li> <li>• <a href="#">CVE-2025-23419</a></li> </ul>                                                |
| push-apps-manager-release | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-968p-4wvh-cqc8</a></li> </ul>                                                                                          |
| cf-networking             | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                     |
| smb-volume                | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>           |
| system-metrics-scraper    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>           |

| Component         | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume        | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-13176</a></li> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-12797</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                            |
| loggregator-agent | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                |
| pxc               | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                |
| statsd-injector   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                |
| log-cache         | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                |
| mysql-monitoring  | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                |
| syslog            | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                                                          |
| garden-runc       | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |
| cf-autoscaling    | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-pr98-23f8-jwxv</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-27hp-xhwr-wr2m</a></li> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">GHSA-5j33-cvvr-w245</a></li> <li>• <a href="#">GHSA-6v67-2wr5-gvf4</a></li> </ul> |

| <b>Component</b>       | <b>Vulnerabilities Resolved</b>                                                                                                                                                                                                                                                                                     |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa                    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-21502</a></li> </ul>                                                                                                                                                                                                                                  |
| bpm                    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> </ul>                                                                                                                                                                                                                                  |
| backup-and-restore-sdk | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> </ul>                                                                                                                                                                                                                                  |
| silk                   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                        |
| loggregator            | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                              |
| mapfs                  | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">GHSA-p782-xgp4-8hr8</a></li> <li>• <a href="#">GHSA-w32m-9786-jp63</a></li> <li>• <a href="#">GHSA-v778-237x-gjrc</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul> |

## Component Release Notes

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b> |
|-----------------------|----------------|----------------------|
| ubuntu-jammy stemcell | 1.775          |                      |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk | 1.19.45 | <p>▼ v1.19.45</p> <pre>### Package Updates: * Updates golang-1-linux from 1.24.0 to 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.44...v1.19.45">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.44...v1.19.45</a></pre> <p>▼ v1.19.44</p> <pre>### Updates: * Updates postgresql-13 from 13.19 to 13.20 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.43...v1.19.44">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.43...v1.19.44</a></pre> <p>▼ v1.19.43</p> <pre>### Updates: * Updates postgresql-13 from 13.18 to 13.19 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.42...v1.19.43">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.42...v1.19.43</a></pre> <p>▼ v1.19.42</p> <pre>### Package Updates: * Updates golang-1-linux from 1.23.6 to 1.24.0 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.41...v1.19.42">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.41...v1.19.42</a></pre> <p>▼ v1.19.41</p> <pre>### Updates: * Updates pcre2 from 10.44 to 10.45 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.40...v1.19.41">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.40...v1.19.41</a></pre> <p>▼ v1.19.40</p> <pre>### Updates: * Updates mariadb from 10.6.20 to 10.6.21 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.39...v1.19.40">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.39...v1.19.40</a></pre> |

| Component                | Version | Release Notes                                                                                                                                                                                              |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| binary-offline-buildpack | 1.1.32  |                                                                                                                                                                                                            |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                            |
| bpm                      | 1.4.16  |                                                                                                                                                                                                            |
| capi                     | 1.203.0 |                                                                                                                                                                                                            |
| cf-autoscaling           | 250.4.1 | <p>▼ v250.4.1</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Project Golang version bumped to 1.23 * Golang dependencies updated * Java dependencies updated</pre></div> |
| cf-cli                   | 1.68.0  |                                                                                                                                                                                                            |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.66.0  | <p>▼ v3.66.0</p> <pre> ## 3.66.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.65.0...v3.66.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.65.0...v3.66.0</a> ## Resources - [Download release 3.66.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.66.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.66.0</a>). </pre> <p>▼ v3.65.0</p> <pre> ## 3.65.0 **Release Date**: January 31, 2025 ## Changes - Bump dependancies - Update iptables-writter to work with multi-cidr overlay networks, which are now available in silk-release 3.65.0. [See here for more info on this effort. ](<a href="https://github.com/cloudfoundry/silk-release/pull/148">https://github.com/cloudfoundry/silk-release/pull/148</a>) ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.64.0...v3.65.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.64.0...v3.65.0</a> ## Resources - [Download release 3.65.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.65.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.65.0</a>). </pre> <p>▼ v3.64.0</p> <pre> ## 3.64.0 **Release Date**: January 21, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.63.0...v3.64.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.63.0...v3.64.0</a> ## Resources - [Download release 3.64.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.64.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.64.0</a>). </pre> |
| cflinuxfs3    | 0.618.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| <b>Component</b>              | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4                    | 1.288.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| count-cores-indicator         | 2.0.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| credhub                       | 2.12.105       | <p>▼ 2.12.105</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.104...2.12.105">https://github.com/pivotal/credhub-release/compare/2.12.104...2.12.105</a></pre> <p>▼ 2.12.104</p> <pre>## What's Changed * Resolved issue <a href="https://github.com/pivotal/credhub-release/issues/291">https://github.com/pivotal/credhub-release/issues/291</a>. * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.103...2.12.104">https://github.com/pivotal/credhub-release/compare/2.12.103...2.12.104</a></pre> <p>▼ 2.12.103</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.102...2.12.103">https://github.com/pivotal/credhub-release/compare/2.12.102...2.12.103</a></pre> |
| diego                         | 2.105.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| dotnet-core-offline-buildpack | 2.4.51         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component            | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc          | 1.70.0  | <p>▼ v1.70.0</p> <pre>## 1.70.0 **Release Date**: February 05, 2025 ## Changes - Upgrade containerd to V2 (<a href="https://github.com/cloudfoundry/garden-runc-release/pull/368">https://github.com/cloudfoundry/garden-runc-release/pull/368</a>, <a href="https://github.com/cloudfoundry/guardian/pull/466">https://github.com/cloudfoundry/guardian/pull/466</a>, <a href="https://github.com/cloudfoundry/wg-app-platform-runtime-ci/pull/61">https://github.com/cloudfoundry/wg-app-platform-runtime-ci/pull/61</a>) - Various dependency bumps ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.69.0...v1.70.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.69.0...v1.70.0</a> ## Resources - [Download release 1.70.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.70.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.70.0</a>).</pre> <p>▼ v1.69.0</p> <pre>## 1.69.0 **Release Date**: February 03, 2025 ## Changes - bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.68.0...v1.69.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.68.0...v1.69.0</a> ## Resources - [Download release 1.69.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.69.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.69.0</a>).</pre> <p>▼ v1.68.0</p> <pre>## 1.68.0 **Release Date**: January 22, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.67.0...v1.68.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.67.0...v1.68.0</a> ## Resources - [Download release 1.68.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.68.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.68.0</a>).</pre> |
| go-offline-buildpack | 1.10.43 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component                       | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-offline-buildpack          | 4.80.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| java-native-image-cnb-buildpack | 0.11.22  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| log-cache                       | 3.1.9    | <p>▼ v3.1.9</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 * Use CAPI v3 instead of v2 by @chombium in <a href="https://github.com/cloudfoundry/log-cache-release/pull/597">https://github.com/cloudfoundry/log-cache-release/pull/597</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.8...v3.1.9">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.8...v3.1.9</a> </pre>                                                                                                                                                                                                                                 |
| loggregator                     | 107.0.20 | <p>▼ v107.0.20</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 * Use CAPI v3 instead of v2 by @chombium in <a href="https://github.com/cloudfoundry/loggregator-release/pull/816">https://github.com/cloudfoundry/loggregator-release/pull/816</a> ## New Contributors * @chombium made their first contribution in <a href="https://github.com/cloudfoundry/loggregator-release/pull/816">https://github.com/cloudfoundry/loggregator-release/pull/816</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.19...v107.0.20">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.19...v107.0.20</a> </pre> |
| loggregator-agent               | 8.3.5    | <p>▼ v8.3.5</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.4...v8.3.5">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.4...v8.3.5</a> </pre> <p>▼ v8.3.4</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.3...v8.3.4">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.3...v8.3.4</a> </pre>                                                                                     |

| Component        | Version | Release Notes                                                                                                                                                          |
|------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| metric-registrar | 4.0.6   |                                                                                                                                                                        |
| mysql-monitoring | 10.22.0 | <p>▼ v10.22.0</p> <div style="border: 1px solid #ccc; padding: 5px;"><p>Dependency bumps</p><ul style="list-style-type: none"><li>* Bump Go to v1.23.6</li></ul></div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats      | 56.41.0 | <p>▼ v56.41.0</p> <pre>## 56.41.0 **Release Date**: March 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.40.0...v56.41.0">https://github.com/cloudfoundry/nats-release/compare/v56.40.0...v56.41.0</a> ## Resources - [Download release 56.41.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.41.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.41.0</a>).</pre> <p>▼ v56.40.0</p> <pre>## 56.40.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.39.0...v56.40.0">https://github.com/cloudfoundry/nats-release/compare/v56.39.0...v56.40.0</a> ## Resources - [Download release 56.40.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.40.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.40.0</a>).</pre> <p>▼ v56.39.0</p> <pre>## 56.39.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.38.0...v56.39.0">https://github.com/cloudfoundry/nats-release/compare/v56.38.0...v56.39.0</a> ## Resources - [Download release 56.39.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.39.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.39.0</a>).</pre> <p>▼ v56.38.0</p> <pre>## 56.38.0 **Release Date**: February 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.37.0...v56.38.0">https://github.com/cloudfoundry/nats-release/compare/v56.37.0...v56.38.0</a></pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>dfoundry/nats-release/compare/v56.37.0...v56.38.0 ## Resources - [Download release 56.38.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.38.0).  ▼ v56.37.0  ## 56.37.0 **Release Date**: January 22, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: https://github.com/cloudfoundry/nats-release/compare/v56.36.0...v56.37.0 ## Resources - [Download release 56.37.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.37.0).</pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.23.0  | <p>▼ v7.23.0</p> <pre> ## 7.23.0 **Release Date**: March 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.22.0...v7.23.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.22.0...v7.23.0</a> ## Resources - [Download release 7.23.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.23.0). </pre>    |
|            |         | <p>▼ v7.22.0</p> <pre> ## 7.22.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.21.0...v7.22.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.21.0...v7.22.0</a> ## Resources - [Download release 7.22.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.22.0). </pre> |
|            |         | <p>▼ v7.21.0</p> <pre> ## 7.21.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.20.0...v7.21.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.20.0...v7.21.0</a> ## Resources - [Download release 7.21.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.21.0). </pre> |
|            |         | <p>▼ v7.20.0</p> <pre> ## 7.20.0 **Release Date**: February 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.19.0...v7.20.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.19.0...v7.20.0</a> ## Resources - [Download release 7.20.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.20.0). </pre> |

| Component | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |           | <pre data-bbox="695 242 1329 422">dfoundry/nfs-volume-release/compare/v7.19.0...v7.20.0 ## Resources - [Download release 7.20.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.20.0).</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|           | ▼ v7.19.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|           |           | <pre data-bbox="695 557 1329 988">## 7.19.0 **Release Date**: January 31, 2025 ## Changes - Fix map-fs-fuse packaging script to avoid collision with binaries installed on compilation-vms in case of re-using compilation vms. ## Built with go 1.23.5 **Full Changelog**: https://github.com/cloudfoundry/nfs-volume-release/compare/v7.18.0...v7.19.0 ## Resources - [Download release 7.19.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.19.0).</pre>                                                                                                                                                                                                                                                                                                                      |
|           | ▼ v7.18.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|           |           | <pre data-bbox="695 1123 1329 2048">## 7.18.0 **Release Date**: January 27, 2025 ## Changes - Move code base from mapfs-release into nfs-volume-release - Add map-fs-performance-acceptance-tests errand ## Bosh Job Spec changes: ```diff diff --git a/jobs/dockerdriver-integration/spec b/jobs/dockerdriver-integration/spec index 51e78351..02a908e9 100644 --- a/jobs/dockerdriver-integration/spec +++ b/jobs/dockerdriver-integration/spec @@ -9,6 +9,7 @@ templates: packages: - dockerdriver-integration - nfs-debs +- map-fs - nfsv3driver @@ -19,4 +20,4 @@ properties: mapfs_path: description: "Path to mapfs binary" - default: /var/vcap/packages/mapfs/bin/mapfs + default: /var/vcap/packages/map-fs/bin/mapfs diff --git a/jobs/map-fs-performance-acceptance-tests/spec b/jobs/map-fs-performance-acc</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> eptance-tests/spec  new file mode 100644  index 00000000..a3f30383  --- /dev/null  +++ b/jobs/map-fs-performance-acceptance-te sts/spec  @@ -0,0 +1,23 @@ +--- +name: map-fs-performance-acceptance-tests + +templates: + pre-start.erb: bin/pre-start + run.erb: bin/run + config.json.erb: config/config.json + +packages: +- map-fs-performance-acceptance-tests +- map-fs +- map-fs-fuse +- nfs-debs + + +properties: + nfs_remote_path: +   description: Address for SMB Remote Pa th +   default: nfstestserver.service.cf.inte rnal:export + + mapfs_path: +   description: "Path to mapfs binary" +   default: /var/vcap/packages/map-fs/bi n/mapfs  diff --git a/jobs/nfsv3driver/spec b/jobs/n fsv3driver/spec  index fc9fe47b..7d5262d8 100644  --- a/jobs/nfsv3driver/spec  +++ b/jobs/nfsv3driver/spec  @@ -17,10 +17,8 @@ templates:  packages:  - nfs-debs  - nfsv3driver  -  -consumes:  -- name: mapfs  - type: mapfs  +- map-fs  +- map-fs-fuse  properties:  nfsv3driver.statd_port:  ```   ## Built with go 1.23.5  **Full Changelog**: <a href="https://github.com/clou dfoundry/nfs-volume-release/compare/v7.17. 0...v7.18.0">https://github.com/clou dfoundry/nfs-volume-release/compare/v7.17. 0...v7.18.0</a> ## Resources - [Download release 7.18.0 from bosh.io](ht </pre> |

| <b>Component</b>          | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                             |
|---------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |                | <code>tps://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.18.0).</code>                                                                                                                                                                                  |
| nginx-offline-buildpack   | 1.2.37         |                                                                                                                                                                                                                                                                                  |
| nodejs-offline-buildpack  | 1.8.49         |                                                                                                                                                                                                                                                                                  |
| notifications             | 77.0.0         |                                                                                                                                                                                                                                                                                  |
| notifications-ui          | 51.0.0         |                                                                                                                                                                                                                                                                                  |
| otel-collector            | 0.11.2         |                                                                                                                                                                                                                                                                                  |
| php-offline-buildpack     | 4.6.40         |                                                                                                                                                                                                                                                                                  |
| push-apps-manager-release | 677.0.67       | <p>▼ 677.0.67</p> <ul style="list-style-type: none"> <li>* show is routable when available</li> <li>* fix bug with custom headers</li> <li>* fix bug where user visibility of spaces effected the ability to bind and unbind services.</li> <li>* update dependencies</li> </ul> |
| push-offline-docs-release | 6.0.169        |                                                                                                                                                                                                                                                                                  |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.156 | <p>▼ v674.0.156</p> <pre>## Changes * creating final release 674.0.155</pre> <p>▼ v674.0.155</p> <pre>## Changes * Fix internal calculation error when rolling over app usages month to month.</pre> <p>▼ v674.0.154</p> <pre>## Changes * chore(deps): update dependency pydriller to v2 * creating final release 674.0.153</pre> <p>▼ v674.0.153</p> <pre>## Changes * creating final release 674.0.152</pre> <p>▼ v674.0.152</p> <pre>## Changes * creating final release 674.0.151</pre> <p>▼ v674.0.151</p> <pre>## Changes * TNZ-31185 - Update archive table load to lookup by guid for latest_app_usage_event_guids (#26) * creating final release 674.0.150</pre> <p>▼ v674.0.150</p> <pre>## Changes * creating final release 674.0.149</pre> <p>▼ v674.0.149</p> <pre>## Changes * Add repository * Add submodule * Checkout with Renovate token * Merge branch 'main' into snookala/TNZ-274</pre> |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | 90             | <ul style="list-style-type: none"> <li>* Merge pull request #20 from TNZ/snookala/TNZ-27490</li> <li>* Merge pull request #21 from TNZ/revert-20-snookala/TNZ-27490</li> <li>* Merge pull request #22 from TNZ/snookala/TNZ-27490-new</li> <li>* Remove broken config values, add dashboard</li> <li>* Revert "TNZ-27490 - Usage Service - Enhancement - Utilize Archive Table"</li> <li>* Set checkout version to v4</li> <li>* TNZ-27490 - Usage Service - Enhancement - Utilize Archive Table</li> <li>* TNZ-27490 - Usage Service - Enhancement - Utilize Archive Table</li> <li>* TNZ-27490 - Usage Service - Enhancement - Utilize Archive Table</li> <li>* Update checkout version</li> <li>* Update the checkout version</li> <li>* add submodules to checkout action</li> <li>* chore: add token?</li> <li>* chore: enable bundler</li> <li>* chore: revert back without submodules</li> <li>* chore: test official checkout action?</li> <li>* creating final release 674.0.147</li> <li>* only run submodules</li> <li>* set checkout to v1</li> <li>* try submodules again</li> <li>* update checkout to 4.1.0</li> <li>* update checkout version to v3</li> <li>* update token</li> </ul> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pxc                      | 1.0.37  | <p>▼ v1.0.37</p> <pre>## Release Notes **New Features** **Dependency bumps** - Bump Go to v1.23.6 - Updates packages and dependencies</pre> <p>▼ v1.0.36</p> <pre>## Release Notes **New Features** - Added support for deploying pxc-release on ubuntu-noble stemcells</pre> <p>▼ v1.0.35</p> <pre>Dependency bumps * Bump Go to v1.23.5 * Bumps Percona XtraDB Cluster to v8.0.40-3 1</pre> |
| python-offline-buildpack | 1.8.44  |                                                                                                                                                                                                                                                                                                                                                                                               |
| r-offline-buildpack      | 1.2.32  |                                                                                                                                                                                                                                                                                                                                                                                               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.331.0 | <p>▼ v0.331.0</p> <pre>## 0.331.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies - Inline multior error submodule - <a href="https://github.com/cloudfoundry/routing-release/pull/454">https://github.com/cloudfoundry/routing-release/pull/454</a> - Thanks @maxmoehl ! ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.330.0...v0.331.0">https://github.com/cloudfoundry/routing-release/compare/v0.330.0...v0.331.0</a> ## Resources - [Download release 0.331.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.331.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.331.0</a>).</pre> <p>▼ v0.330.0</p> <pre>## 0.330.0 **Release Date**: February 07, 2025 ## Changes - bump dependancies - add extendable bosh property to log extra access log fields - <a href="https://github.com/cloudfoundry/routing-release/pull/448">https://github.com/cloudfoundry/routing-release/pull/448</a> - thanks @maxmoehl ! ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 868629ac..9d694a02 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -322,6 +322,14 @@ properties:   router.logging.syslog_network:     description: "Network protocol to use when connecting to the syslog server. Valid values are 'tcp', 'udp', . When choosing an empty string value, the local syslog daemon is used."     default: "udp" +   router.logging.extra_access_log_fields: +     description:   +       An array of additional access log fields to log. Any new log fields will only be exposed via +         this property and operators have to explicitly enable them. This is done to prevent breaking +         log parsing in existing setups by the introduction of new fields. Does not affect stdout / +         stderr logs. +         Available fields are: local_address +         default: []</pre> |

| <b>Component</b>          | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |                | <pre> router.logging.format.timestamp:   description:       Format for timestamp in component logs. Valid values are 'rfc3339', 'deprecated', and 'unix-epoch'.""     ```      ## Built with go 1.23.6     **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.329.0...v0.330.0">https://github.com/cloudfoundry/routing-release/compare/v0.329.0...v0.330.0</a>     ## Resources     - [Download release 0.330.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.330.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.330.0</a>).   </pre> |
| ruby-offline-buildpack    | 1.10.36        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| web-servers-cnb-buildpack | 0.15.2         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.66.0  | <p>▼ v3.66.0</p> <pre>## 3.66.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.65.0...v3.66.0">https://github.com/cloudfoundry/silk-release/compare/v3.65.0...v3.66.0</a> ## Resources - [Download release 3.66.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.66.0).</pre> <p>▼ v3.65.0</p> <pre>## 3.65.0 **Release Date**: January 31, 2025 ## Changes - Bump dependancies - New feature: the overlay network (as defined in the silk-controller job as the "network" property) can now be an array of CIDR addresses instead of just one CIDR address. For backwards compatibility reasons providing a string of one CIDR is still an allowed format. [See here for more info on this effort. ](https://github.com/cloudfoundry/silk-release/pull/148) Thanks @ameowlia ! ## Bosh Job Spec changes: ```diff diff --git a/jobs/silk-cni/spec b/jobs/silk-cni/spec index 670763da..75936752 100644 --- a/jobs/silk-cni/spec +++ b/jobs/silk-cni/spec @@ -10,8 +10,6 @@ packages: - silk-cni consumes: -- name: cf_network - type: cf_network - name: vpa type: policy-agent @@ -31,7 +29,10 @@ provides: properties: no_masquerade_cidr_range: - description: "CIDR address block that should not be masqueraded. Fallback to cf_network.network link property if property is not provided." + description:   + When set, app traffic sent to this CIDR will not be masqueraded. If this + property is not set, then silk-cni will not masquerade traffic sent to the</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>+           overlay network, which allows container-to-container networking to work.  default: ""  mtu: diff --git a/jobs/silk-controller/spec b/jobs/silk-controller/spec index cc7529a8..cb66ale8 100644 --- a/jobs/silk-controller/spec +++ b/jobs/silk-controller/spec @@ -29,8 +29,12 @@ provides:  properties:  network: -   description: "CIDR address block for overlay network. Subnets for each diego cell are allocated out of this network." -   default: "10.255.0.0/16" +   description:   +     A single CIDR address block as a string, or an array of CIDR address +     blocks for overlay network as an array of strings. Subnets for each diego +     cell are allocated out of this network. The "subnet_prefix_length" +     property must be smaller than the smallest CIDR address block. +   default: ["10.255.0.0/16"]  subnet_prefix_length: description: "Length, in bits, of the prefix for subnets allocated per Diego cell, e.g. '24' for a '/24' subnet." diff --git a/jobs/silk-daemon/spec b/jobs/silk-daemon/spec index e3786357..572b08c9 100644 --- a/jobs/silk-daemon/spec +++ b/jobs/silk-daemon/spec @@ -88,7 +88,13 @@ properties:  default: false  single_ip_only: -   description: "When true, this VM will get assigned exactly one IP address on the Silk network. Use this to connect this VM to the Silk network without acquiring a whole block of addresses (as would be required for a Diego Cell)." +   description:   +     When true, this VM will get assigned exactly one IP address on the Silk +     network. Use this to connect this VM to the Silk network without +     acquiring a whole block of addresses (as would be required for a Diego +     Cell). WARNING: Do not use single_ip_only mode when the overlay network has +     more than one CIDR. The overlay network is set on the silk-controller +     job via the "network" bosh property.</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>default: false policy_server_url: ```  ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.64.0...v3.65.0">https://github.com/cloudfoundry/silk-release/compare/v3.64.0...v3.65.0</a>  ## Resources - [Download release 3.65.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.65.0).</pre> <p>▼ v3.64.0</p> <pre>## 3.64.0 **Release Date**: January 21, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.63.0...v3.64.0">https://github.com/cloudfoundry/silk-release/compare/v3.63.0...v3.64.0</a>  ## Resources - [Download release 3.64.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.64.0).</pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume | 3.22.0  | <p>▼ v3.22.0</p> <pre> ## 3.22.0 **Release Date**: March 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.21.0...v3.22.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.21.0...v3.22.0</a> ## Resources - [Download release 3.22.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.22.0). </pre> <p>▼ v3.21.0</p> <pre> ## 3.21.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.20.0...v3.21.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.20.0...v3.21.0</a> ## Resources - [Download release 3.21.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.21.0). </pre> <p>▼ v3.20.0</p> <pre> ## 3.20.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.19.0...v3.20.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.19.0...v3.20.0</a> ## Resources - [Download release 3.20.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.20.0). </pre> <p>▼ v3.19.0</p> <pre> ## 3.19.0 **Release Date**: February 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.18.0...v3.19.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.18.0...v3.19.0</a> </pre> |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |         | <pre data-bbox="695 242 1334 422">dfoundry/smb-volume-release/compare/v3.18.0...v3.19.0 ## Resources - [Download release 3.19.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.19.0).</pre> <p data-bbox="679 473 779 500">▼ v3.18.0</p> <pre data-bbox="695 557 1334 1051">## 3.18.0 **Release Date**: January 30, 2025 ## Changes - Fixes a bug where smb broker didn't allow the same mount options that smb driver allowed (was missing `sec`, `dir_mode`, and `file_mode`) - Dependency bumps ## Built with go 1.23.5 **Full Changelog**: https://github.com/cloudfoundry/smb-volume-release/compare/v3.17.0...v3.18.0 ## Resources - [Download release 3.18.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.18.0).</pre> <p data-bbox="679 1102 779 1129">▼ v3.17.0</p> <pre data-bbox="695 1185 1334 1596">## 3.17.0 **Release Date**: January 22, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: https://github.com/cloudfoundry/smb-volume-release/compare/v3.16.0...v3.17.0 ## Resources - [Download release 3.17.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.17.0).</pre> |
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| staticfile-offline-buildpack | 1.8.26  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| <b>Component</b>       | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| statsd-injector        | 1.11.47        | <p>▼ v1.11.47</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 **Full Changelog**: <a href="https://github.com/clo dfoundry/statsd-injector-release/compare/v1.1 1.46...v1.11.47">https://github.com/clo dfoundry/statsd-injector-release/compare/v1.1 1.46...v1.11.47</a></pre>                                                                                                                                                                                                                                                                                                                                     |
| syslog                 | 12.3.7         | <p>▼ v12.3.7</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/clo dfoundry/syslog-release/compare/v12.3.6...v1 2.3.7">https://github.com/clo dfoundry/syslog-release/compare/v12.3.6...v1 2.3.7</a></pre>                                                                                                                                                                                                                                                                                                                                                            |
| system-metrics-scraper | 4.0.17         | <p>▼ v4.0.17</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 **Full Changelog**: <a href="https://github.com/clo dfoundry/system-metrics-scraper-release/compa re/v4.0.16...v4.0.17">https://github.com/clo dfoundry/system-metrics-scraper-release/compa re/v4.0.16...v4.0.17</a></pre> <p>▼ v4.0.16</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/clo dfoundry/system-metrics-scraper-release/compa re/v4.0.15...v4.0.16">https://github.com/clo dfoundry/system-metrics-scraper-release/compa re/v4.0.15...v4.0.16</a></pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa               | 77.20.3 | <p>▼ v77.20.3</p> <pre>       ##### New UAA       * Bump to [UAA v77.20.3] (https://github.com/cloudfoundry/uaa/releases/tag/v77.20.3)        ##### Fixes       * [Upgrade Tomcat to version 9.0.100] (https://github.com/cloudfoundry/uaa-release/commit/7c07585cfcc2a1d30df940a3df08739698140488f)       * [Upgrade Bellsoft JDK to version 17.0.14+10] (https://github.com/cloudfoundry/uaa-release/commit/181355610834c8c74caee6a9751e55261b763ac0)        ##### Dependency bumps       * [Bump nokogiri from 1.18.1 to 1.18.2] (https://github.com/cloudfoundry/uaa-release/commit/ba59cf9f8d0f10c85344d0e0c0bc3e93fc7eca70)       * [Bump i18n from 1.14.6 to 1.14.7] (https://github.com/cloudfoundry/uaa-release/commit/56ca6196882e0e2abc15841b8b22c533489413ad)       * [Bump rspec-core from 3.13.2 to 3.13.3] (https://github.com/cloudfoundry/uaa-release/commit/0cf8e7936417bd0d3a759bfb4f67cf082a52bbf6)       * [Bump logger from 1.6.5 to 1.6.6] (https://github.com/cloudfoundry/uaa-release/commit/8a3c86b93fad5888eb6e85a2107562b6738c63df)       * [Bump diff-lcs from 1.5.1 to 1.6.0] (https://github.com/cloudfoundry/uaa-release/commit/d571eb77fbbfddeca3736c8ba86a61a412b1a992)       * [Bump github.com/cloudfoundry/bosh-utils in /src/acceptance_tests] (https://github.com/cloudfoundry/uaa-release/commit/f7ec7975db8c48e485f03fb13164947e6007f0d2)        **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.20.2...v77.20.3     </pre> |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 6.0.12

**Release Date:** 02/03/2025

- **[Bug Fix]** Fix intermittent connectivity issue for TCP routes from external tiles with old routing-release versions
- **[Feature Improvement]** Apps Manager only lists the name of a space that hosts shared services if you have access to that space; otherwise it lists the space's GUID.
- **[Feature Improvement]** Add optional, experimental pprof extension to OTel Collector
- **[Feature Improvement]** Enable Space Auditors to view app autoscaling rules

- **[Feature Improvement]** Explicitly set the allowed ciphers for Diego ssh proxy. Previously these were set in the code.
- **[Feature Improvement]** Puma web server is no longer beta
- Bump backup-and-restore-sdk to version [1.19.39](#)
- Bump binary-offline-buildpack to version [1.1.28](#)
- Bump bpm to version [1.4.11](#)
- Bump capi to version [1.200.0](#)
- Bump cf-autoscaling to version [250.4.0](#)
- Bump cf-networking to version [3.63.0](#)
- Bump cflinuxfs3 to version [0.592.0](#)
- Bump cflinuxfs4 to version [1.274.0](#)
- Bump credhub to version [2.12.102](#)
- Bump dotnet-core-offline-buildpack to version [2.4.47](#)
- Bump garden-runc to version [1.67.0](#)
- Bump go-offline-buildpack to version [1.10.37](#)
- Bump java-offline-buildpack to version [4.77.0](#)
- Bump log-cache to version [3.1.8](#)
- Bump loggregator to version [107.0.19](#)
- Bump loggregator-agent to version [8.3.3](#)
- Bump mapfs to version [1.17.0](#)
- Bump metric-registrar to version [4.0.6](#)
- Bump mysql-monitoring to version [10.21.0](#)
- Bump nats to version [56.36.0](#)
- Bump nfs-volume to version [7.17.0](#)
- Bump nginx-offline-buildpack to version [1.2.33](#)
- Bump nodejs-offline-buildpack to version [1.8.44](#)
- Bump notifications to version [77.0.0](#)
- Bump otel-collector to version [0.11.2](#)
- Bump php-offline-buildpack to version [4.6.36](#)
- Bump push-apps-manager-release to version [677.0.66](#)
- Bump push-usage-service-release to version [674.0.147](#)
- Bump pxc to version [1.0.34](#)
- Bump python-offline-buildpack to version [1.8.40](#)

- Bump r-offline-buildpack to version 1.2.28
- Bump routing to version 0.329.0
- Bump ruby-offline-buildpack to version 1.10.32
- Bump silk to version 3.63.0
- Bump smb-volume to version 3.16.0
- Bump staticfile-offline-buildpack to version 1.8.21
- Bump statsd-injector to version 1.11.46
- Bump syslog to version 12.3.6
- Bump system-metrics-scraper to version 4.0.15
- Bump uaa to version 77.20.2

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs component since the previous patch version of TAS for VMs:

| Component                 | Vulnerabilities Resolved                                                                                                                                                                                                                                                            |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| system-metrics-scraper    | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                                                                               |
| push-apps-manager-release | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2016-4074</a></li> <li>• <a href="#">GHSA-f5x3-32g6-xq36</a></li> <li>• <a href="#">CVE-2015-8863</a></li> </ul>                                                                                                           |
| credhub                   | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-5j33-cvvr-w245</a></li> <li>• <a href="#">GHSA-27hp-xhwr-wr2m</a></li> </ul>                                                                                                                                              |
| loggregator               | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                                                                               |
| otel-collector            | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-mh55-gqvf-xfwm</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-xr7q-jx4m-x55m</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul> |
| garden-runc               | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2024-45336</a></li> </ul>                                                                                                                                                        |

| Component              | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa                    | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-5j33-cvvr-w245</a></li> <li>• <a href="#">GHSA-27hp-xhwr-wr2m</a></li> </ul>                                                                                                                                                                                                                                                                                                                                      |
| bpm                    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2024-45336</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                |
| notifications          | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2016-4074</a></li> <li>• <a href="#">CVE-2015-8863</a></li> <li>• <a href="#">CVE-2024-45336</a></li> </ul>                                                                                                                                                                                                                                                              |
| syslog                 | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                                                                                                                                                                                                                                                                       |
| capi                   | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-cfjx-w229-hgx5</a></li> <li>• <a href="#">GHSA-w8gc-x259-rc7x</a></li> <li>• <a href="#">GHSA-638j-pmjw-jq48</a></li> <li>• <a href="#">GHSA-2x5m-9ch4-qgrr</a></li> <li>• <a href="#">GHSA-vfm5-rmrh-j26v</a></li> <li>• <a href="#">GHSA-rxv5-gxqc-xx8g</a></li> <li>• <a href="#">CVE-2024-27282</a></li> </ul>                                                                                                |
| log-cache              | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                                                                                                                                                                                                                                                                       |
| backup-and-restore-sdk | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2024-34156</a></li> <li>• <a href="#">CVE-2024-10977</a></li> <li>• <a href="#">CVE-2024-10978</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-34158</a></li> <li>• <a href="#">CVE-2024-7348</a></li> <li>• <a href="#">CVE-2024-10976</a></li> <li>• <a href="#">CVE-2024-10979</a></li> <li>• <a href="#">CVE-2024-34155</a></li> </ul> |

| Component         | Vulnerabilities Resolved                                                                                                                                                                                              |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| metric-registrar  | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                 |
| statsd-injector   | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                 |
| mysql-monitoring  | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-34156</a></li> <li>• <a href="#">GHSA-29wx-vh33-7x7r</a></li> <li>• <a href="#">CVE-2024-34158</a></li> <li>• <a href="#">CVE-2024-34155</a></li> </ul> |
| loggregator-agent | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> </ul>                                 |

## Component Release Notes

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.719   |               |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk   | 1.19.39 | <p>▼ v1.19.39</p> <pre>### Updates: * Updates mysql-8 from 8.0.40 to 8.0.41 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.38...v1.19.39">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.38...v1.19.39</a></pre> <p>▼ v1.19.38</p> <pre>### Package Updates: * Updates golang-1-linux from 1.23.4 to 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.37...v1.19.38">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.37...v1.19.38</a></pre> <p>▼ v1.19.37</p> <pre>### Fixed CVEs: * CVE-2024-45337: golang.org/x/crypto/ssh: Misuse of ServerConfig.PublicKeyCallback may cause authorization bypass in golang.org/x/crypto * CVE-2024-45338: golang.org/x/net/html: Non-linear parsing of case-insensitive content in golang.org/x/net/html  ### Package Updates: * Updates golang-1-linux to 1.23.4 ### Updates: * Updates mariadb from 10.6.19 to 10.6.20 * Updates mysql-8 from 8.0.39 to 8.0.40 * Updates postgresql-13 from 13.16 to 13.18 * Updates postgresql-15 from 15.8 to 15.9 ## What's Changed * Remove unused OpenSSL 1.1 blob by @ystros in <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/pull/1846">https://github.com/cloudfoundry/backup-and-restore-sdk-release/pull/1846</a> * Remove support for Postgres 11 by @ystros in <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/pull/1845">https://github.com/cloudfoundry/backup-and-restore-sdk-release/pull/1845</a> ## New Contributors * @ystros made their first contribution in <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/pull/1846">https://github.com/cloudfoundry/backup-and-restore-sdk-release/pull/1846</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.36...v1.19.37">https://github.com/cloudfoundry/backup-and-restore-sdk-release/compare/v1.19.36...v1.19.37</a></pre> |
| binary-offline-buildpack | 1.1.28  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                    |
|----------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| bpm            | 1.4.11  |                                                                                                                                                                                                                                                                                                                  |
| capi           | 1.200.0 |                                                                                                                                                                                                                                                                                                                  |
| cf-autoscaling | 250.4.0 | <p>▼ v250.4.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Feature enhancement: space auditors can view autoscaling rules. * Permissions endpoints now distinguish between GET requests and actual resource management requests using the 'readOnly' query param</pre></div> |
| cf-cli         | 1.68.0  |                                                                                                                                                                                                                                                                                                                  |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.63.0  | <p>▼ v3.63.0</p> <pre>## 3.63.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.62.0...v3.63.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.62.0...v3.63.0</a> ## Resources - [Download release 3.63.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.63.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.63.0</a>).</pre> <p>▼ v3.62.0</p> <pre>## 3.62.0 **Release Date**: December 21, 2024 ## Changes - Bump go mod dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.61.0...v3.62.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.61.0...v3.62.0</a> ## Resources - [Download release 3.62.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.62.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.62.0</a>).</pre> <p>▼ v3.61.0</p> <pre>## 3.61.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.60.0...v3.61.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.60.0...v3.61.0</a> ## Resources - [Download release 3.61.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.61.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.61.0</a>).</pre> |
| cflinuxfs3    | 0.592.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component                     | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4                    | 1.274.0  | <p>▼ v1.131.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.131.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.131.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.131.0</a>)</p> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| count-cores-indicator         | 2.0.0    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| credhub                       | 2.12.102 | <p>▼ 2.12.102</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.101...2.12.102">https://github.com/pivotal/credhub-release/compare/2.12.101...2.12.102</a></pre> </div> <p>▼ 2.12.101</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.100...2.12.101">https://github.com/pivotal/credhub-release/compare/2.12.100...2.12.101</a></pre> </div> <p>▼ 2.12.100</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.99...2.12.100">https://github.com/pivotal/credhub-release/compare/2.12.99...2.12.100</a></pre> </div> <p>▼ 2.12.99</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.98...2.12.99">https://github.com/pivotal/credhub-release/compare/2.12.98...2.12.99</a></pre> </div> |
| diego                         | 2.105.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| dotnet-core-offline-buildpack | 2.4.47   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc                     | 1.67.0  | <p>▼ v1.67.0</p> <pre>## 1.67.0 **Release Date**: January 17, 2025 ## Changes - Add support for cgroups v2 <a href="https://github.com/cloudfoundry/guardian/pull/465">https://github.com/cloudfoundry/guardian/pull/465</a> ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.66.0...v1.67.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.66.0...v1.67.0</a> ## Resources - [Download release 1.67.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.67.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.67.0</a>).</pre> <p>▼ v1.66.0</p> <pre>## 1.66.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.65.0...v1.66.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.65.0...v1.66.0</a> ## Resources - [Download release 1.66.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.66.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.66.0</a>).</pre> <p>▼ v1.65.0</p> <pre>## 1.65.0 **Release Date**: December 20, 2024 ## Changes - Fix path for functions #367 - Various dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.64.0...v1.65.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.64.0...v1.65.0</a> ## Resources - [Download release 1.65.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.65.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.65.0</a>).</pre> |
| go-offline-buildpack            | 1.10.37 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| java-offline-buildpack          | 4.77.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| java-native-image-cnb-buildpack | 0.11.22 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component         | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache         | 3.1.8    | <p>▼ v3.1.8</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.7...v3.1.8">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.7...v3.1.8</a></pre></div>                    |
| loggregator       | 107.0.19 | <p>▼ v107.0.19</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.18...v107.0.19">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.18...v107.0.19</a></pre></div> |
| loggregator-agent | 8.3.3    | <p>▼ v8.3.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.2...v8.3.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.2...v8.3.3</a></pre></div>    |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mapfs     | 1.17.0  | <p>▼ v1.17.0</p> <pre>## 1.17.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.16.0...v1.17.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.16.0...v1.17.0</a> ## Resources - [Download release 1.17.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.17.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.17.0</a>).</pre>       |
|           |         | <p>▼ v1.16.0</p> <pre>## 1.16.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.15.0...v1.16.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.15.0...v1.16.0</a> ## Resources - [Download release 1.16.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.16.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.16.0</a>).</pre>       |
|           |         | <p>▼ v1.15.0</p> <pre>## 1.15.0 **Release Date**: December 20, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.14.0...v1.15.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.14.0...v1.15.0</a> ## Resources - [Download release 1.15.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.15.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.15.0</a>).</pre> |
|           |         | <p>▼ v1.14.0</p> <pre>## 1.14.0 **Release Date**: December 17, 2024 ## Changes * [Bump] (<a href="https://github.com/cloudfoundry/mapfs-release/commit/782c0f7f2e877f175d5796708af02ecd67bc7065">https://github.com/cloudfoundry/mapfs-release/commit/782c0f7f2e877f175d5796708af02ecd67bc7065</a>) <a href="https://github.com/mesonbuild">https://github.com/mesonbuild</a></pre>                                                                                                                                                                       |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                | <pre>d/meson/releases/tag/1.6.1 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.13.0...v1.14.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.13.0...v1.14.0</a> ## Resources - [Download release 1.14.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.14.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.14.0</a>).</pre> <p>▼ v1.13.0</p> <pre>## 1.13.0 **Release Date**: December 16, 2024 ## Changes - Update dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.12.0...v1.13.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.12.0...v1.13.0</a> ## Resources - [Download release 1.13.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.13.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.13.0</a>).</pre> |
| metric-registrar | 4.0.6          | <p>▼ v4.0.6</p> <pre>## What's Changed * Bump dependencies * Update packaged Go to go1.23.4</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mysql-monitoring | 10.21.0 | <p>▼ v10.21.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Dependency bumps</p><ul style="list-style-type: none"><li>* Bump to golang.org/x/net@v0.33.0 to address CVE-2024-45338 / GHSA-w32m-9786-jp63</li></ul></div> <p>▼ v10.20.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Dependency bumps</p><ul style="list-style-type: none"><li>* Bump to golang.org/x/crypto@v0.31.0 to address CVE-2024-45337 / GHSA-v778-237x-gjrc</li></ul></div> <p>▼ v10.19.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Dependency bumps</p><ul style="list-style-type: none"><li>* Bump Go to v1.23.4</li></ul></div> <p>▼ v10.17.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>### Release Notes</p><ul style="list-style-type: none"><li>- removes replication-canary and associated jobs</li><li>- dependency bumps</li><li>- update to golang 1.23.1</li></ul></div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats      | 56.36.0 | <p>▼ v56.36.0</p> <pre>## 56.36.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.35.0...v56.36.0">https://github.com/cloudfoundry/nats-release/compare/v56.35.0...v56.36.0</a> ## Resources - [Download release 56.36.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.36.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.36.0</a>).</pre>         |
|           |         | <p>▼ v56.35.0</p> <pre>## 56.35.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.34.0...v56.35.0">https://github.com/cloudfoundry/nats-release/compare/v56.34.0...v56.35.0</a> ## Resources - [Download release 56.35.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.35.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.35.0</a>).</pre>         |
|           |         | <p>▼ v56.34.0</p> <pre>## 56.34.0 **Release Date**: December 20, 2024 ## Changes - Bump go mod dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.33.0...v56.34.0">https://github.com/cloudfoundry/nats-release/compare/v56.33.0...v56.34.0</a> ## Resources - [Download release 56.34.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.34.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.34.0</a>).</pre> |
|           |         | <p>▼ v56.33.0</p> <pre>## 56.33.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.32.0...v56.33.0">https://github.com/cloudfoundry/nats-release/compare/v56.32.0...v56.33.0</a></pre>                                                                                                                                                                                                                                           |

| Component | Version | Release Notes                                                                                                                                                                                       |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>dfoundry/nats-release/compare/v56.32.0...v56.33.0 ## Resources - [Download release 56.33.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.33.0).</pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.17.0  | <p>▼ v7.17.0</p> <pre> ## 7.17.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.16.0...v7.17.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.16.0...v7.17.0</a> ## Resources - [Download release 7.17.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.17.0). </pre>       |
|            |         | <p>▼ v7.16.0</p> <pre> ## 7.16.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.15.0...v7.16.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.15.0...v7.16.0</a> ## Resources - [Download release 7.16.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.16.0). </pre>       |
|            |         | <p>▼ v7.15.0</p> <pre> ## 7.15.0 **Release Date**: December 20, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.14.0...v7.15.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.14.0...v7.15.0</a> ## Resources - [Download release 7.15.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.15.0). </pre> |
|            |         | <p>▼ v7.14.0</p> <pre> ## 7.14.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.13.0...v7.14.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.13.0...v7.14.0</a> ## Resources - [Download release 7.14.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.14.0). </pre>      |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                       |
|--------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |         | <pre>dfoundry/nfs-volume-release/compare/v7.13. 0...v7.14.0 ## Resources - [Download release 7.14.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.14.0).</pre>                                                                        |
| nginx-offline-buildpack  | 1.2.33  |                                                                                                                                                                                                                                                                                     |
| nodejs-offline-buildpack | 1.8.44  |                                                                                                                                                                                                                                                                                     |
| notifications            | 77.0.0  | <p>▼ v77.0.0</p> <ul style="list-style-type: none"> <li>* update golang</li> </ul> <p>▼ v76.0.0</p> <ul style="list-style-type: none"> <li>* update jq</li> </ul> <p>▼ v75.0.0</p> <ul style="list-style-type: none"> <li>* update dependencies</li> <li>* update golang</li> </ul> |
| notifications-ui         | 51.0.0  |                                                                                                                                                                                                                                                                                     |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| otel-collector        | 0.11.2  | <p>▼ v0.11.2</p> <pre>## What's Changed * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.1...v0.11.2">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.1...v0.11.2</a></pre> <p>▼ v0.11.1</p> <pre>## What's Changed * Correctly interpolate `secret` properties when the `name` includes a hyphen by @acostal1 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/58">https://github.com/cloudfoundry/otel-collector-release/pull/58</a> * Load string values in `allow_list` properties by @ctlong in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/59">https://github.com/cloudfoundry/otel-collector-release/pull/59</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.1</a></pre> <p>▼ v0.11.0</p> <pre>## What's Changed * Bump packaged Golang to go1.22.8 * Bump OTel Collector components to v0.111.0 by @mkocher in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/56">https://github.com/cloudfoundry/otel-collector-release/pull/56</a> * `otlp` exporter now has batching built in * Internal metrics are now emitted with names prefixed with `otelcol_` * Change `allow_list` properties by @acostal1 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/57">https://github.com/cloudfoundry/otel-collector-release/pull/57</a> * Unspecified or `nil` still equates to "allow all" * An empty array now equates to "allow nothing" instead of "allow all" * Add `pprof` extension by @acostal1 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/57">https://github.com/cloudfoundry/otel-collector-release/pull/57</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.0</a></pre> |
| php-offline-buildpack | 4.6.36  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release | 677.0.66 | <p>▼ 677.0.66</p> <div style="border: 1px solid #ccc; padding: 5px;"><ul style="list-style-type: none"><li>* update dependencies</li></ul></div> <p>▼ 677.0.65</p> <div style="border: 1px solid #ccc; padding: 5px;"><ul style="list-style-type: none"><li>* Set content transfer encoding http header s for search server</li><li>* update dependencies</li></ul></div> |
| push-offline-docs-release | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                           |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.147 | <p>▼ v674.0.147</p> <pre>## Changes * TNZ-24336 - Usage Service - Enhancement - Archive Table (#16)   * creating final release 674.0.146</pre> <p>▼ v674.0.146</p> <pre>## Changes * Merge pull request #11 from TNZ/snookala/TNZ-24336   * Merge pull request #12 from TNZ/revert-11-snookala/TNZ-24336     * Revert "TNZ-24336 - Usage Service - Enhancement - Archive Table"       * TNZ-24336 - Usage Service - Enhancement - Archive Table         * creating final release 674.0.145</pre> <p>▼ v674.0.145</p> <pre>## Changes * creating final release 674.0.144</pre> <p>▼ v674.0.144</p> <pre>## Changes * creating final release 674.0.143</pre> <p>▼ v674.0.143</p> <pre>## Changes * chore: attempt to fix pip3 install within make   * chore: fix path for the release notes source     * chore: fix path of the task.sh file       * chore: update bosh CLI with correct version for new releases         * chore: update to the 0.1.142 essentials image           * creating final release 674.0.138             * fix: move release note task to usage-service-release repo due to new python version</pre> <p>▼ v674.0.138</p> <pre>## Changes * creating final release 674.0.137</pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                     |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pxc                      | 1.0.34  | <p>▼ v1.0.34</p> <div style="border: 1px solid #ccc; padding: 5px;"><p>Dependency bumps</p><ul style="list-style-type: none"><li>* Bump to golang.org/x/net@v0.33.0 to address CVE-2024-45338 / GHSA-w32m-9786-jp63</li><li>* Bump to golang.org/x/crypto@v0.31.0 to address CVE-2024-45337 / GHSA-v778-237x-gjrc</li></ul></div> |
| python-offline-buildpack | 1.8.40  |                                                                                                                                                                                                                                                                                                                                   |
| r-offline-buildpack      | 1.2.28  |                                                                                                                                                                                                                                                                                                                                   |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.329.0 | <p>▼ v0.329.0</p> <pre> ## 0.329.0 **Release Date**: January 21, 2025 ## Changes - **BREAKING CHANGE**: The `lb_algo` load balancing option key name has been renamed to `loadbalancing`. This standardizes the name across components. Read more about this change [here](https://github.com/cloudfoundry/community/pull/1039). - Bump to go 1.23.5. - Bump dependancies. ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index b9afabbe..c39eac91 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -144,7 +144,7 @@ properties:  writable (optional, boolean): sets the writable flag. defaults to false  options object  - lb_algo (optional, string): Load balancing algorithm for routing incoming requests to the backend: 'round-robin' or 'least-connection'. In cases where this option is not specified, the algorithm defined in gorouter spec is applied. + loadbalancing (optional, string): Load balancing algorithm for routing incoming requests to the backend: 'round-robin' or 'least-connection'. In cases where this option is not specified, the algorithm defined in gorouter spec is applied. example:   - name: my-service @@ -162,7 +162,7 @@ properties:  timeout: 5s  route_service_url: https://my-oauth-proxy-route-service.example.com  options: - lb_algo: least-connection + loadbalancing: least-connection - name: my-tls-endpoint tls_port: 12346 server_cert_domain_san: "my-tls-endpoint.internal.com" ``` ## Built with go 1.23.5 **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.328.0...v0.329.0 ## Resources - [Download release 0.329.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release/v0.329.0) </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ry/routing-release?version=0.329.0).</p> <p>▼ v0.328.0</p> <pre> ## 0.328.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.327.0...v0.328.0">https://github.com/cloudfoundry/routing-release/compare/v0.327.0...v0.328.0</a> ## Resources - [Download release 0.328.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.328.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.328.0</a>). </pre> <p>▼ v0.327.0</p> <pre> ## 0.327.0 **Release Date**: December 20, 2024 ## Changes - Bug fix: update the tcp_routes table to have host_tls_port default to 0 instead of NUL L. Before this fix, tcp routes registered via external-to-cf route registrars running routing-release 0.301.0 or lower will have intermittent connectivity issues. - <a href="https://github.com/cloudfoundry/routing-api/pull/67">https://github.com/cloudfoundry/routing-api/pull/67</a> - Thanks @ameowlia! - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.326.0...v0.327.0">https://github.com/cloudfoundry/routing-release/compare/v0.326.0...v0.327.0</a> ## Resources - [Download release 0.327.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.327.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.327.0</a>). </pre> <p>▼ v0.326.0</p> <pre> ## 0.326.0 **Release Date**: December 16, 2024 ## Changes - **Breaking Change:** Gorouter will now properly emit [RFC5424] (<a href="https://datatracker.ietf.org/doc/html/rfc5424">https://datatracker.ietf.org/doc/html/rfc5424</a>) syslog messages instead of broken BSD-style syslog messages. It now only supports syslog over UDP and TCP like it is documented for some time now - [gorouter #459] (<a href="https://github.com/cloudfoundry/gorouter/pull/459">https://github.com/cloudfoundry/gorouter/pull/459</a>) &amp; [gorouter #411] (<a href="https://github.com/cloudfoundry/gorouter/pull/411">https://github.com/cloudfoundry/gorouter/pull/411</a>) - Tha </pre> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |         | <pre> nks @maxmoehl and @peanball !   - Gorouter now supports configurable syslog     message truncation via gorouter's new router.     logging.syslog_message_limit bosh property [g     orouter #447] (<a href="https://github.com/cloudfoundry/routing-release/pull/447">https://github.com/cloudfoundry/routing-release/pull/447</a>) - Thanks @maxmoeh     l !   - Bump tcp-router's haproxy to 2.8.13   - Bump dependencies   ## Bosh Job Spec changes:   ```diff   diff --git a/jobs/gorouter/spec b/jobs/goro   ute/spec   index cdebbd5a..868629ac 100644   --- a/jobs/gorouter/spec   +++ b/jobs/gorouter/spec   @@ -313,6 +313,9 @@   properties:     router.logging.syslog_tag:       description: "Tag to use when writing syslo       g messages"       default: "vcap.gorouter"     + router.logging.syslog_message_limit:     +   description: "Limit the number of byte       s per access log written to syslog. A value o       f zero disables the limit."     +   default: 0     router.logging.syslog_addr:       description: "Address of a syslog server to       send access logs"       default: "localhost:514"     ...   ## Built with go 1.23.4   **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.325.0...v0.326.0">https://github.com/cloudfoundry/routing-release/compare/v0.325.0...v0.326.0</a>   ## Resources   - [Download release 0.326.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.326.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.326.0</a>). </pre> |
| ruby-offline-buildpack    | 1.10.32 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| web-servers-cnb-buildpack | 0.15.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.63.0  | <p>▼ v3.63.0</p> <pre>## 3.63.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.62.0...v3.63.0">https://github.com/cloudfoundry/silk-release/compare/v3.62.0...v3.63.0</a> ## Resources - [Download release 3.63.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.63.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.63.0</a>).</pre> <p>▼ v3.62.0</p> <pre>## 3.62.0 **Release Date**: December 21, 2024 ## Changes - Bump go mod dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.61.0...v3.62.0">https://github.com/cloudfoundry/silk-release/compare/v3.61.0...v3.62.0</a> ## Resources - [Download release 3.62.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.62.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.62.0</a>).</pre> <p>▼ v3.61.0</p> <pre>## 3.61.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.60.0...v3.61.0">https://github.com/cloudfoundry/silk-release/compare/v3.60.0...v3.61.0</a> ## Resources - [Download release 3.61.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.61.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.61.0</a>).</pre> |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume                   | 3.16.0  | <p>▼ v3.16.0</p> <pre>## 3.16.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.15.0...v3.16.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.15.0...v3.16.0</a> ## Resources - [Download release 3.16.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.16.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.16.0</a>).</pre> <p>▼ v3.15.0</p> <pre>## 3.15.0 **Release Date**: December 20, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.14.0...v3.15.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.14.0...v3.15.0</a> ## Resources - [Download release 3.15.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.15.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.15.0</a>).</pre> <p>▼ v3.14.0</p> <pre>## 3.14.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.13.0...v3.14.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.13.0...v3.14.0</a> ## Resources - [Download release 3.14.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.14.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.14.0</a>).</pre> |
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| staticfile-offline-buildpack | 1.8.21  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| statsd-injector        | 1.11.46 | <p>▼ v1.11.46</p> <pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cdfoundry/statsd-injector-release/compare/v1.1.45...v1.11.46">https://github.com/cdfoundry/statsd-injector-release/compare/v1.1.45...v1.11.46</a></pre>                                                                                                                                                                                                                                                                                            |
| syslog                 | 12.3.6  | <p>▼ v12.3.6</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cdfoundry/syslog-release/compare/v12.3.5...v12.3.6">https://github.com/cdfoundry/syslog-release/compare/v12.3.5...v12.3.6</a></pre>                                                                                                                                                                                                                                                                                                        |
| system-metrics-scraper | 4.0.15  | <p>▼ v4.0.15</p> <pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cdfoundry/system-metrics-scraper-release/compare/v4.0.14...v4.0.15">https://github.com/cdfoundry/system-metrics-scraper-release/compare/v4.0.14...v4.0.15</a></pre> <p>▼ v4.0.14</p> <pre>## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/cdfoundry/system-metrics-scraper-release/compare/v4.0.13...v4.0.14">https://github.com/cdfoundry/system-metrics-scraper-release/compare/v4.0.13...v4.0.14</a></pre> |
| uaa                    | 77.20.2 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| tanzu-jammy-stack      | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## 6.0.11

**Release Date:** 01/09/2025

- **[Bug Fix]** Stop Autoscaler panic when RabbitMQ password includes reserved characters
- Bump backup-and-restore-sdk to version [1.19.36](#)
- Bump binary-offline-buildpack to version [1.1.15](#)

- Bump bpm to version [1.4.6](#)
- Bump capi to version [1.197.0](#)
- Bump cf-autoscaling to version [250.3.6](#)
- Bump cf-cli to version [1.68.0](#)
- Bump cf-networking to version [3.60.0](#)
- Bump credhub to version [2.12.98](#)
- Bump dotnet-core-offline-buildpack to version [2.4.36](#)
- Bump garden-runc to version [1.64.0](#)
- Bump go-offline-buildpack to version [1.10.24](#)
- Bump log-cache to version [3.1.7](#)
- Bump loggregator to version [107.0.18](#)
- Bump loggregator-agent to version [8.3.2](#)
- Bump mapfs to version [1.12.0](#)
- Bump metric-registrar to version [4.0.5](#)
- Bump nats to version [56.32.0](#)
- Bump nfs-volume to version [7.13.0](#)
- Bump nginx-offline-buildpack to version [1.2.20](#)
- Bump nodejs-offline-buildpack to version [1.8.30](#)
- Bump notifications to version [74.0.0](#)
- Bump notifications-ui to version [51.0.0](#)
- Bump php-offline-buildpack to version [4.6.25](#)
- Bump push-apps-manager-release to version [677.0.64](#)
- Bump push-usage-service-release to version [674.0.137](#)
- Bump pxc to version [1.0.33](#)
- Bump python-offline-buildpack to version [1.8.30](#)
- Bump r-offline-buildpack to version [1.2.16](#)
- Bump routing to version [0.325.0](#)
- Bump ruby-offline-buildpack to version [1.10.19](#)
- Bump silk to version [3.60.0](#)
- Bump smb-volume to version [3.13.0](#)
- Bump staticfile-offline-buildpack to version [1.6.18](#)
- Bump statsd-injector to version [1.11.45](#)
- Bump syslog to version [12.3.5](#)

- Bump system-metrics-scraper to version [4.0.13](#)
- Bump uaa to version [77.20.0](#)

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs component since the previous patch version of TAS for VMs:

| Component                 | Vulnerabilities Resolved                                                                                                                                           |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| binary-offline-buildpack  | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-34156</a></li><li>• <a href="#">CVE-2024-34158</a></li><li>• <a href="#">CVE-2024-34155</a></li></ul> |
| push-offline-docs-release | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-45614</a></li><li>• <a href="#">CVE-2024-47220</a></li></ul>                                          |

| Component                 | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-28863</a></li> <li>• <a href="#">GHSA-rhx6-c78j-4q9w</a></li> <li>• <a href="#">CVE-2021-44906</a></li> <li>• <a href="#">CVE-2024-47764</a></li> <li>• <a href="#">GHSA-4vvj-4cpr-p986</a></li> <li>• <a href="#">CVE-2021-23343</a></li> <li>• <a href="#">CVE-2017-16137</a></li> <li>• <a href="#">CVE-2023-28155</a></li> <li>• <a href="#">GHSA-pxg6-pf52-xh8x</a></li> <li>• <a href="#">CVE-2021-3807</a></li> <li>• <a href="#">CVE-2022-38900</a></li> <li>• <a href="#">CVE-2023-45133</a></li> <li>• <a href="#">CVE-2022-3517</a></li> <li>• <a href="#">CVE-2018-1109</a></li> <li>• <a href="#">CVE-2022-46175</a></li> <li>• <a href="#">CVE-2024-21538</a></li> <li>• <a href="#">CVE-2024-43788</a></li> <li>• <a href="#">CVE-2021-23337</a></li> <li>• <a href="#">CVE-2024-21536</a></li> <li>• <a href="#">CVE-2020-28500</a></li> <li>• <a href="#">CVE-2020-36604</a></li> <li>• <a href="#">CVE-2021-23566</a></li> <li>• <a href="#">CVE-2024-47068</a></li> <li>• <a href="#">CVE-2024-4068</a></li> <li>• <a href="#">CVE-2020-28469</a></li> <li>• <a href="#">CVE-2024-4067</a></li> </ul> |
| log-cache                 | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component        | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs3       | <ul style="list-style-type: none"><li>• <a href="#">CVE-2021-31799</a></li><li>• <a href="#">CVE-2017-18342</a></li><li>• <a href="#">CVE-2018-13348</a></li><li>• <a href="#">CVE-2020-25613</a></li><li>• <a href="#">CVE-2020-8130</a></li><li>• <a href="#">CVE-2020-14343</a></li><li>• <a href="#">CVE-2023-26112</a></li><li>• <a href="#">CVE-2024-27280</a></li><li>• <a href="#">CVE-2020-10663</a></li><li>• <a href="#">CVE-2021-41817</a></li><li>• <a href="#">CVE-2024-47220</a></li><li>• <a href="#">CVE-2018-16395</a></li><li>• <a href="#">CVE-2022-29526</a></li><li>• <a href="#">CVE-2019-3902</a></li><li>• <a href="#">CVE-2018-13347</a></li><li>• <a href="#">CVE-2018-17983</a></li><li>• <a href="#">CVE-2018-13346</a></li></ul> |
| metric-registrar | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">CVE-2023-45288</a></li><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| notifications    | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| bpm              | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Component                       | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-native-image-cnb-buildpack | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-29903</a></li> <li>• <a href="#">CVE-2023-33201</a></li> <li>• <a href="#">CVE-2022-41720</a></li> <li>• <a href="#">CVE-2022-2879</a></li> <li>• <a href="#">CVE-2024-24557</a></li> <li>• <a href="#">CVE-2024-51744</a></li> <li>• <a href="#">CVE-2024-41110</a></li> <li>• <a href="#">CVE-2023-39323</a></li> <li>• <a href="#">CVE-2024-21208</a></li> <li>• <a href="#">CVE-2022-30635</a></li> <li>• <a href="#">CVE-2023-24537</a></li> <li>• <a href="#">CVE-2023-45287</a></li> <li>• <a href="#">GHSA-vp35-85q5-9f25</a></li> <li>• <a href="#">CVE-2023-29403</a></li> <li>• <a href="#">CVE-2024-25710</a></li> <li>• <a href="#">CVE-2024-21210</a></li> <li>• <a href="#">CVE-2022-23471</a></li> <li>• <a href="#">CVE-2022-24921</a></li> <li>• <a href="#">CVE-2022-30631</a></li> <li>• <a href="#">CVE-2022-41715</a></li> <li>• <a href="#">CVE-2023-33199</a></li> <li>• <a href="#">CVE-2023-44487</a></li> <li>• <a href="#">CVE-2023-24540</a></li> <li>• <a href="#">CVE-2024-24785</a></li> <li>• <a href="#">CVE-2022-41725</a></li> <li>• <a href="#">CVE-2022-30629</a></li> <li>• <a href="#">CVE-2023-28842</a></li> <li>• <a href="#">CVE-2024-21085</a></li> <li>• <a href="#">CVE-2022-27664</a></li> <li>• <a href="#">CVE-2024-21140</a></li> <li>• <a href="#">CVE-2022-27191</a></li> <li>• <a href="#">CVE-2023-45284</a></li> <li>• <a href="#">CVE-2022-32149</a></li> <li>• <a href="#">CVE-2024-34156</a></li> <li>• <a href="#">CVE-2023-2976</a></li> <li>• <a href="#">GHSA-jq35-85cj-fj4p</a></li> <li>• <a href="#">CVE-2023-39318</a></li> <li>• <a href="#">CVE-2024-30172</a></li> </ul> |

| Component | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <ul style="list-style-type: none"><li>• CVE-2023-30551</li><li>• CVE-2023-48795</li><li>• CVE-2024-29902</li><li>• CVE-2022-29173</li><li>• CVE-2023-28841</li><li>• CVE-2024-21068</li><li>• CVE-2023-2253</li><li>• CVE-2022-36056</li><li>• CVE-2022-32148</li><li>• CVE-2022-30630</li><li>• CVE-2023-29409</li><li>• CVE-2024-24789</li><li>• CVE-2022-30580</li><li>• CVE-2024-24579</li><li>• CVE-2023-39325</li><li>• CVE-2023-25153</li><li>• GHSA-3633-5h82-39pq</li><li>• CVE-2023-45290</li><li>• CVE-2022-41716</li><li>• CVE-2024-21145</li><li>• CVE-2024-24787</li><li>• CVE-2023-24531</li><li>• CVE-2023-29400</li><li>• GHSA-m425-mq94-257g</li><li>• CVE-2024-24783</li><li>• CVE-2024-21138</li><li>• CVE-2022-30634</li><li>• CVE-2024-21131</li><li>• CVE-2022-28948</li><li>• CVE-2023-39326</li><li>• CVE-2023-29402</li><li>• CVE-2023-46737</li><li>• CVE-2022-32189</li><li>• CVE-2022-30632</li><li>• CVE-2023-24538</li><li>• CVE-2024-21012</li><li>• CVE-2022-24769</li><li>• CVE-2024-24791</li></ul> |

| Component | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <ul style="list-style-type: none"><li>• CVE-2023-45288</li><li>• CVE-2024-21094</li><li>• CVE-2024-34158</li><li>• CVE-2022-2880</li><li>• CVE-2022-1962</li><li>• CVE-2024-29857</li><li>• CVE-2024-0406</li><li>• CVE-2023-45283</li><li>• GHSA-c9cp-9c75-9v8c</li><li>• CVE-2020-15250</li><li>• CVE-2023-29405</li><li>• CVE-2023-29406</li><li>• CVE-2024-41909</li><li>• CVE-2022-41723</li><li>• CVE-2024-24786</li><li>• CVE-2022-1705</li><li>• CVE-2023-24534</li><li>• CVE-2023-3978</li><li>• CVE-2023-25173</li><li>• CVE-2024-24784</li><li>• CVE-2023-24532</li><li>• CVE-2022-30633</li><li>• CVE-2022-28131</li><li>• CVE-2024-21144</li><li>• CVE-2024-21011</li><li>• CVE-2022-31030</li><li>• CVE-2023-6378</li><li>• CVE-2022-24675</li><li>• CVE-2020-8908</li><li>• CVE-2022-29526</li><li>• CVE-2022-41724</li><li>• CVE-2022-21698</li><li>• CVE-2023-29404</li><li>• CVE-2022-35929</li><li>• CVE-2022-36109</li><li>• CVE-2024-6104</li><li>• CVE-2024-21235</li><li>• CVE-2023-24536</li></ul> |

| Component               | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-28327</a></li> <li>• <a href="#">CVE-2024-24790</a></li> <li>• <a href="#">CVE-2023-45289</a></li> <li>• <a href="#">CVE-2024-28180</a></li> <li>• <a href="#">CVE-2022-41722</a></li> <li>• <a href="#">CVE-2022-29804</a></li> <li>• <a href="#">CVE-2024-47554</a></li> <li>• <a href="#">CVE-2022-41717</a></li> <li>• <a href="#">CVE-2024-34155</a></li> <li>• <a href="#">CVE-2023-45285</a></li> <li>• <a href="#">CVE-2023-28840</a></li> <li>• <a href="#">CVE-2023-39319</a></li> <li>• <a href="#">CVE-2024-21217</a></li> <li>• <a href="#">CVE-2023-33202</a></li> <li>• <a href="#">CVE-2023-24539</a></li> <li>• <a href="#">CVE-2024-26308</a></li> <li>• <a href="#">CVE-2024-21147</a></li> <li>• <a href="#">GHSA-7ww5-4wqc-m92c</a></li> <li>• <a href="#">CVE-2024-30171</a></li> <li>• <a href="#">CVE-2024-29018</a></li> </ul> |
| nginx-offline-buildpack | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-32760</a></li> <li>• <a href="#">CVE-2023-44487</a></li> <li>• <a href="#">CVE-2024-34161</a></li> <li>• <a href="#">CVE-2024-24989</a></li> <li>• <a href="#">CVE-2024-7347</a></li> <li>• <a href="#">CVE-2024-31079</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2024-24990</a></li> <li>• <a href="#">CVE-2022-41742</a></li> <li>• <a href="#">CVE-2022-41741</a></li> <li>• <a href="#">CVE-2024-35200</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component              | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-offline-buildpack | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-27281</a></li><li>• <a href="#">CVE-2024-8184</a></li><li>• <a href="#">CVE-2024-21208</a></li><li>• <a href="#">CVE-2024-25710</a></li><li>• <a href="#">CVE-2024-21210</a></li><li>• <a href="#">CVE-2022-41966</a></li><li>• <a href="#">CVE-2024-34447</a></li><li>• <a href="#">CVE-2023-28756</a></li><li>• <a href="#">CVE-2024-39908</a></li><li>• <a href="#">CVE-2022-25647</a></li><li>• <a href="#">CVE-2023-22796</a></li><li>• <a href="#">CVE-2024-41123</a></li><li>• <a href="#">CVE-2024-29025</a></li><li>• <a href="#">CVE-2023-2976</a></li><li>• <a href="#">CVE-2024-30172</a></li><li>• <a href="#">CVE-2024-47072</a></li><li>• <a href="#">CVE-2024-6763</a></li><li>• <a href="#">GHSA-cr5q-6q9f-rq6q</a></li><li>• <a href="#">CVE-2023-36617</a></li><li>• <a href="#">CVE-2024-41946</a></li><li>• <a href="#">CVE-2022-40151</a></li><li>• <a href="#">CVE-2024-27282</a></li><li>• <a href="#">CVE-2024-29857</a></li><li>• <a href="#">GHSA-pj73-v5mw-pm9j</a></li><li>• <a href="#">CVE-2023-28755</a></li><li>• <a href="#">CVE-2024-7254</a></li><li>• <a href="#">CVE-2020-8908</a></li><li>• <a href="#">CVE-2024-38807</a></li><li>• <a href="#">CVE-2024-52317</a></li><li>• <a href="#">CVE-2024-35176</a></li><li>• <a href="#">CVE-2024-35255</a></li><li>• <a href="#">CVE-2024-21235</a></li><li>• <a href="#">CVE-2024-43398</a></li><li>• <a href="#">CVE-2024-47554</a></li><li>• <a href="#">CVE-2024-47535</a></li><li>• <a href="#">CVE-2024-49761</a></li><li>• <a href="#">CVE-2024-21217</a></li><li>• <a href="#">CVE-2024-26308</a></li></ul> |

| Component                | Vulnerabilities Resolved                                                                                                                                                                                                                                 |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-30171</a></li> </ul>                                                                                                                                                                       |
| notifications-ui         | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-37788</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                             |
| garden-runc              | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                                                                       |
| loggregator              | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                   |
| diego                    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-51744</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                             |
| system-metrics-scraper   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                   |
| cflinuxfs4               | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                                                                       |
| tanzu-jammy-stack        | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2022-41723</a></li> <li>• <a href="#">CVE-2023-3978</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                          |
| nodejs-offline-buildpack | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-22020</a></li> <li>• <a href="#">CVE-2022-40897</a></li> <li>• <a href="#">CVE-2024-9287</a></li> <li>• <a href="#">CVE-2024-6345</a></li> <li>• <a href="#">CVE-2024-36138</a></li> </ul> |
| go-offline-buildpack     | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                    |
| silk                     | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                                                                       |
| loggregator-agent        | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                   |

| Component              | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| ruby-offline-buildpack | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-21830</a></li><li>• <a href="#">CVE-2024-27281</a></li><li>• <a href="#">CVE-2024-21208</a></li><li>• <a href="#">GHSA-r7qv-8r2h-pg27</a></li><li>• <a href="#">CVE-2024-21210</a></li><li>• <a href="#">CVE-2024-20945</a></li><li>• <a href="#">CVE-2024-21085</a></li><li>• <a href="#">CVE-2024-39908</a></li><li>• <a href="#">CVE-2024-21140</a></li><li>• <a href="#">CVE-2023-21843</a></li><li>• <a href="#">CVE-2023-22796</a></li><li>• <a href="#">CVE-2024-41123</a></li><li>• <a href="#">CVE-2023-21939</a></li><li>• <a href="#">CVE-2023-22049</a></li><li>• <a href="#">CVE-2024-20952</a></li><li>• <a href="#">CVE-2024-21068</a></li><li>• <a href="#">CVE-2023-21967</a></li><li>• <a href="#">CVE-2024-20919</a></li><li>• <a href="#">CVE-2024-21145</a></li><li>• <a href="#">CVE-2023-21930</a></li><li>• <a href="#">GHSA-cr5q-6q9f-rq6q</a></li><li>• <a href="#">CVE-2024-21138</a></li><li>• <a href="#">CVE-2024-21131</a></li><li>• <a href="#">CVE-2024-41946</a></li><li>• <a href="#">CVE-2023-21938</a></li><li>• <a href="#">CVE-2024-21094</a></li><li>• <a href="#">CVE-2023-21954</a></li><li>• <a href="#">CVE-2023-22081</a></li><li>• <a href="#">CVE-2024-20926</a></li><li>• <a href="#">CVE-2023-22045</a></li><li>• <a href="#">GHSA-pj73-v5mw-pm9j</a></li><li>• <a href="#">CVE-2023-21937</a></li><li>• <a href="#">CVE-2024-21144</a></li><li>• <a href="#">CVE-2024-21011</a></li><li>• <a href="#">CVE-2024-35176</a></li><li>• <a href="#">CVE-2023-21968</a></li><li>• <a href="#">CVE-2024-20921</a></li><li>• <a href="#">CVE-2024-21235</a></li></ul> |

| Component        | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                               |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-43398</a></li><li>• <a href="#">CVE-2023-22067</a></li><li>• <a href="#">CVE-2024-49761</a></li><li>• <a href="#">CVE-2024-21217</a></li><li>• <a href="#">CVE-2024-20918</a></li><li>• <a href="#">CVE-2024-21147</a></li></ul>                                          |
| mysql-monitoring | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-51744</a></li><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                              |
| maps             | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                       |
| smoke-tests      | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-26141</a></li><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">CVE-2024-21510</a></li><li>• <a href="#">CVE-2024-47220</a></li><li>• <a href="#">CVE-2024-25126</a></li><li>• <a href="#">CVE-2022-29526</a></li><li>• <a href="#">CVE-2024-26146</a></li></ul> |
| nfs-volume       | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                       |
| syslog           | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">CVE-2023-45288</a></li><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                     |

| Component                  | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| push-usage-service-release | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-2rxp-v6pw-ch6m</a></li> <li>• <a href="#">GHSA-9hf4-67fc-4vf4</a></li> <li>• <a href="#">GHSA-vfg9-r3fq-jvx4</a></li> <li>• <a href="#">GHSA-wwhv-wxv9-rpgw</a></li> <li>• <a href="#">CVE-2024-45614</a></li> <li>• <a href="#">CVE-2024-21510</a></li> <li>• <a href="#">CVE-2024-47887</a></li> <li>• <a href="#">GHSA-6f62-3596-g6w7</a></li> <li>• <a href="#">CVE-2024-47888</a></li> <li>• <a href="#">CVE-2024-41128</a></li> <li>• <a href="#">CVE-2024-47889</a></li> <li>• <a href="#">CVE-2024-47220</a></li> <li>• <a href="#">GHSA-x76w-6vjr-8xgj</a></li> <li>• <a href="#">CVE-2024-49761</a></li> <li>• <a href="#">GHSA-h47h-mwp9-c6q6</a></li> </ul>                                                                                                                                                                                                                                                                                              |
| capi                       | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-27281</a></li> <li>• <a href="#">GHSA-wwh7-4jw9-33x6</a></li> <li>• <a href="#">GHSA-vfg9-r3fq-jvx4</a></li> <li>• <a href="#">GHSA-jj47-x69x-mxrm</a></li> <li>• <a href="#">CVE-2024-39908</a></li> <li>• <a href="#">CVE-2020-8130</a></li> <li>• <a href="#">CVE-2023-22796</a></li> <li>• <a href="#">CVE-2024-41123</a></li> <li>• <a href="#">CVE-2024-21510</a></li> <li>• <a href="#">CVE-2024-47887</a></li> <li>• <a href="#">GHSA-jphg-qwrw-7w9g</a></li> <li>• <a href="#">CVE-2022-24795</a></li> <li>• <a href="#">CVE-2024-41946</a></li> <li>• <a href="#">CVE-2017-16516</a></li> <li>• <a href="#">CVE-2024-41128</a></li> <li>• <a href="#">CVE-2020-10663</a></li> <li>• <a href="#">CVE-2018-1000201</a></li> <li>• <a href="#">GHSA-x76w-6vjr-8xgj</a></li> <li>• <a href="#">CVE-2022-29526</a></li> <li>• <a href="#">CVE-2024-35176</a></li> <li>• <a href="#">CVE-2024-43398</a></li> <li>• <a href="#">CVE-2024-49761</a></li> </ul> |

| Component                     | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking                 | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                               |
| pxc                           | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-34156</a></li><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">GHSA-45x7-px36-x8w8</a></li><li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li><li>• <a href="#">CVE-2024-34158</a></li><li>• <a href="#">CVE-2022-29526</a></li><li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li><li>• <a href="#">CVE-2024-34155</a></li></ul> |
| nats                          | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                               |
| dotnet-core-offline-buildpack | <ul style="list-style-type: none"><li>• <a href="#">CVE-2021-44906</a></li><li>• <a href="#">CVE-2020-7792</a></li><li>• <a href="#">CVE-2022-21213</a></li></ul>                                                                                                                                                                                                                              |
| smb-volume                    | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                               |
| backup-and-restore-sdk        | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                               |

| Component      | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| cf-autoscaling | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-24557</a></li><li>• <a href="#">CVE-2024-21208</a></li><li>• <a href="#">CVE-2024-21210</a></li><li>• <a href="#">CVE-2024-20945</a></li><li>• <a href="#">CVE-2024-21140</a></li><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">CVE-2024-20952</a></li><li>• <a href="#">CVE-2024-21068</a></li><li>• <a href="#">CVE-2025-21502</a></li><li>• <a href="#">CVE-2024-20919</a></li><li>• <a href="#">CVE-2024-21145</a></li><li>• <a href="#">CVE-2024-21138</a></li><li>• <a href="#">CVE-2024-21131</a></li><li>• <a href="#">CVE-2024-21012</a></li><li>• <a href="#">CVE-2023-45288</a></li><li>• <a href="#">CVE-2024-21094</a></li><li>• <a href="#">CVE-2023-22081</a></li><li>• <a href="#">CVE-2024-21011</a></li><li>• <a href="#">CVE-2022-29526</a></li><li>• <a href="#">CVE-2023-22025</a></li><li>• <a href="#">CVE-2024-20921</a></li><li>• <a href="#">CVE-2024-21235</a></li><li>• <a href="#">CVE-2024-20932</a></li><li>• <a href="#">CVE-2024-21217</a></li><li>• <a href="#">CVE-2024-20918</a></li><li>• <a href="#">CVE-2024-21147</a></li></ul> |

| Component      | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| credhub        | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-21208</a></li> <li>• <a href="#">CVE-2024-21210</a></li> <li>• <a href="#">CVE-2024-38816</a></li> <li>• <a href="#">CVE-2024-38828</a></li> <li>• <a href="#">CVE-2021-23463</a></li> <li>• <a href="#">CVE-2024-38820</a></li> <li>• <a href="#">GHSA-c4q5-6c82-3qpw</a></li> <li>• <a href="#">CVE-2016-1000027</a></li> <li>• <a href="#">CVE-2022-23221</a></li> <li>• <a href="#">CVE-2021-42392</a></li> <li>• <a href="#">CVE-2024-38821</a></li> <li>• <a href="#">GHSA-q3v6-hm2v-pw99</a></li> <li>• <a href="#">CVE-2022-45868</a></li> <li>• <a href="#">GHSA-xq3w-v528-46rv</a></li> <li>• <a href="#">CVE-2024-52317</a></li> <li>• <a href="#">CVE-2024-21235</a></li> <li>• <a href="#">GHSA-qvf5-hvjk-wm27</a></li> <li>• <a href="#">CVE-2024-47535</a></li> <li>• <a href="#">CVE-2024-21217</a></li> </ul> |
| uaa            | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-21208</a></li> <li>• <a href="#">CVE-2024-21210</a></li> <li>• <a href="#">CVE-2024-38816</a></li> <li>• <a href="#">CVE-2024-38828</a></li> <li>• <a href="#">CVE-2024-38820</a></li> <li>• <a href="#">GHSA-c4q5-6c82-3qpw</a></li> <li>• <a href="#">CVE-2016-1000027</a></li> <li>• <a href="#">CVE-2024-38821</a></li> <li>• <a href="#">GHSA-r68h-jhhj-9jvm</a></li> <li>• <a href="#">GHSA-q3v6-hm2v-pw99</a></li> <li>• <a href="#">CVE-2024-52317</a></li> <li>• <a href="#">CVE-2024-21235</a></li> <li>• <a href="#">GHSA-qvf5-hvjk-wm27</a></li> <li>• <a href="#">CVE-2024-21217</a></li> </ul>                                                                                                                                                                                                                   |
| otel-collector | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component       | Vulnerabilities Resolved                                                                                                                                           |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| statsd-injector | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">CVE-2023-45288</a></li><li>• <a href="#">CVE-2022-29526</a></li></ul> |

| Component             | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| php-offline-buildpack | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-27043</a></li><li>• <a href="#">CVE-2024-27281</a></li><li>• <a href="#">CVE-2024-8926</a></li><li>• <a href="#">CVE-2024-1874</a></li><li>• <a href="#">CVE-2023-28756</a></li><li>• <a href="#">CVE-2024-39908</a></li><li>• <a href="#">CVE-2023-22796</a></li><li>• <a href="#">CVE-2024-41123</a></li><li>• <a href="#">CVE-2024-34156</a></li><li>• <a href="#">CVE-2024-7592</a></li><li>• <a href="#">CVE-2024-9026</a></li><li>• <a href="#">CVE-2024-3219</a></li><li>• <a href="#">CVE-2024-8927</a></li><li>• <a href="#">CVE-2024-27280</a></li><li>• <a href="#">CVE-2024-24789</a></li><li>• <a href="#">CVE-2024-3096</a></li><li>• <a href="#">CVE-2024-4577</a></li><li>• <a href="#">GHSA-cr5q-6q9f-rq6q</a></li><li>• <a href="#">CVE-2023-36617</a></li><li>• <a href="#">CVE-2021-32740</a></li><li>• <a href="#">CVE-2024-41946</a></li><li>• <a href="#">CVE-2024-27282</a></li><li>• <a href="#">CVE-2024-24791</a></li><li>• <a href="#">CVE-2024-6923</a></li><li>• <a href="#">CVE-2023-45288</a></li><li>• <a href="#">CVE-2024-8088</a></li><li>• <a href="#">CVE-1999-0678</a></li><li>• <a href="#">CVE-2024-34158</a></li><li>• <a href="#">GHSA-pj73-v5mw-pm9j</a></li><li>• <a href="#">CVE-2024-5458</a></li><li>• <a href="#">CVE-2020-13482</a></li><li>• <a href="#">CVE-2023-28755</a></li><li>• <a href="#">CVE-2024-8925</a></li><li>• <a href="#">CVE-2024-6232</a></li><li>• <a href="#">CVE-2024-5585</a></li><li>• <a href="#">CVE-2024-9287</a></li><li>• <a href="#">CVE-2024-35176</a></li><li>• <a href="#">CVE-2024-2408</a></li></ul> |

| Component                | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|                          | <ul style="list-style-type: none"><li>• <a href="#">CVE-2024-24790</a></li><li>• <a href="#">CVE-2024-43398</a></li><li>• <a href="#">CVE-2024-34155</a></li><li>• <a href="#">CVE-2024-49761</a></li><li>• <a href="#">CVE-1999-0289</a></li><li>• <a href="#">CVE-2024-2756</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| routing                  | <ul style="list-style-type: none"><li>• <a href="#">CVE-2022-29526</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| python-offline-buildpack | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-27043</a></li><li>• <a href="#">CVE-2024-11168</a></li><li>• <a href="#">CVE-2024-5642</a></li><li>• <a href="#">CVE-2024-4032</a></li><li>• <a href="#">CVE-2024-7592</a></li><li>• <a href="#">CVE-2024-0397</a></li><li>• <a href="#">CVE-2024-37891</a></li><li>• <a href="#">CVE-2024-35195</a></li><li>• <a href="#">CVE-2024-3219</a></li><li>• <a href="#">CVE-2023-36632</a></li><li>• <a href="#">CVE-2022-40897</a></li><li>• <a href="#">CVE-2024-6923</a></li><li>• <a href="#">CVE-2024-8088</a></li><li>• <a href="#">CVE-2024-39689</a></li><li>• <a href="#">CVE-2024-6232</a></li><li>• <a href="#">CVE-2024-9287</a></li><li>• <a href="#">CVE-2024-6345</a></li><li>• <a href="#">CVE-2023-5752</a></li><li>• <a href="#">CVE-2024-4030</a></li><li>• <a href="#">CVE-2024-3651</a></li></ul> |

| <b>Component</b>          | <b>Vulnerabilities Resolved</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| web-servers-cnb-buildpack | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-24557</a></li> <li>• <a href="#">CVE-2024-51744</a></li> <li>• <a href="#">CVE-2024-41110</a></li> <li>• <a href="#">CVE-2023-39323</a></li> <li>• <a href="#">CVE-2023-44487</a></li> <li>• <a href="#">CVE-2024-24785</a></li> <li>• <a href="#">CVE-2023-45284</a></li> <li>• <a href="#">GHSA-xr7q-jx4m-x55m</a></li> <li>• <a href="#">CVE-2024-34156</a></li> <li>• <a href="#">CVE-2023-39318</a></li> <li>• <a href="#">CVE-2024-24789</a></li> <li>• <a href="#">CVE-2024-24579</a></li> <li>• <a href="#">CVE-2023-39325</a></li> <li>• <a href="#">CVE-2023-45290</a></li> <li>• <a href="#">CVE-2024-24787</a></li> <li>• <a href="#">CVE-2023-24531</a></li> <li>• <a href="#">CVE-2024-24783</a></li> <li>• <a href="#">CVE-2023-39326</a></li> <li>• <a href="#">CVE-2024-24791</a></li> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2024-34158</a></li> <li>• <a href="#">CVE-2024-0406</a></li> <li>• <a href="#">CVE-2023-45283</a></li> <li>• <a href="#">CVE-2024-24786</a></li> <li>• <a href="#">CVE-2024-24784</a></li> <li>• <a href="#">CVE-2024-24790</a></li> <li>• <a href="#">CVE-2023-45289</a></li> <li>• <a href="#">CVE-2024-34155</a></li> <li>• <a href="#">CVE-2023-45285</a></li> <li>• <a href="#">CVE-2023-39319</a></li> </ul> |

## Component Release Notes

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b> |
|-----------------------|----------------|----------------------|
| ubuntu-jammy stemcell | 1.651          |                      |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk   | 1.19.36 | <p>▼ v1.19.36</p> <pre>## Changes * Add final release 1.19.35 [ci skip]</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| binary-offline-buildpack | 1.1.15  | <p>▼ 1.1.15</p> <pre>* go.mod: update go version * Uncached buildpack SHA256: 3f49e2f1794e56 e5d0f2c95e627382a2fc23c060cd905e17c61470ae622 edf83 * Uncached buildpack SHA256: 743c3fc88e6198 ea7949abf64fdcaa4875d3fae10e09051cc51630e3c38f 61ac0 * Uncached buildpack SHA256: 93731fa6e62e5c e94f9ebfdc3ccdddef0db950375e5dbd69cc08ee655547 dbea8 * go.mod: update go version * Uncached buildpack SHA256: f3d4551e3ee531 c6e51cb5cc68a0ff3968398a56bf2315bca763e6388c2 f9b1d * Uncached buildpack SHA256: 53f2668a9d71a2 72d59927a4278609d16463fa5c38e2ae8606d73a4cd73 e0954 * Uncached buildpack SHA256: 430ab5b4f9baba 759df0f9cbfb8855deb4f193678e029e1c4cf3c681540 756ab</pre> |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| bpm                      | 1.4.6   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| capi                     | 1.197.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| cf-autoscaling           | 250.3.6 | <p>▼ v250.3.6</p> <pre>### What's Changed * Bump to latest GA of openjdk: 17.0.13 * Manually package openjdk instead of consuming bosh release * Bump go.mod dependencies</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| cf-cli                   | 1.68.0  | <p>▼ v1.68.0</p> <pre>### Included CF CLI versions: 7.7.15 8.8.3</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.60.0  | <p>▼ v3.60.0</p> <pre>## 3.60.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.59.0...v3.60.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.59.0...v3.60.0</a> ## Resources - [Download release 3.60.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.60.0).</pre> <p>▼ v3.59.0</p> <pre>## 3.59.0 **Release Date**: December 04, 2024 ## Changes - Upgrade cf-networking-healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.58.0...v3.59.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.58.0...v3.59.0</a> ## Resources - [Download release 3.59.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.59.0).</pre> <p>▼ v3.58.0</p> <pre>## 3.58.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.57.0...v3.58.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.57.0...v3.58.0</a> ## Resources - [Download release 3.58.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.58.0).</pre> <p>▼ v3.57.0</p> <pre>## 3.57.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps - Updated unit/integration/cf-networking-ac</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ceptance testing output to be less verbose on happy paths. Thanks @davewalter!</p> <pre>## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.56.0...v3.57.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.56.0...v3.57.0</a> ## Resources - [Download release 3.57.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.57.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.57.0</a>).</pre>                                                                                                                                                                                                                                                                                      |
|           |         | <p>▼ v3.56.0</p> <pre>## 3.56.0 **Release Date**: November 18, 2024 ## Changes - Upgrade cf-networking-healthchecker - Bump Go - Add Extra Response Headers handler to proxy example app - <a href="https://github.com/cloudfoundry/cf-networking-release/pull/310">https://github.com/cloudfoundry/cf-networking-release/pull/310</a> - Thanks @ameowlia ! - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.55.0...v3.56.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.55.0...v3.56.0</a> ## Resources - [Download release 3.56.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.56.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.56.0</a>).</pre> |
|           |         | <p>▼ v3.55.0</p> <pre>## 3.55.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.54.0...v3.55.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.54.0...v3.55.0</a> ## Resources - [Download release 3.55.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.55.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.55.0</a>).</pre>                                                                                                                                                                                                                                                                               |
|           |         | <p>▼ v3.54.0</p> <pre>## 3.54.0 **Release Date**: November 05, 2024 ## Changes - [Convert PortAllocator's ints to uint32 to avoid int overflows when picking ports] (<a href="https://github.com/cloudfoundry/cf-networking-release/pull/309">https://github.com/cloudfoundry/cf-networking-release/pull/309</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |         | <pre> ps://github.com/cloudfoundry/cf-networking-release/commit/7d4c9490695f1cab72341d13300b15cb35707bf) ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.53.0...v3.54.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.53.0...v3.54.0</a>  ## Resources - [Download release 3.54.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.54.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.54.0</a>).  ▼ v3.53.0  ## 3.53.0 **Release Date**: October 22, 2024 ## Changes - Bump dependancies - Use Server struct to address gosec G114 - <a href="https://github.com/cloudfoundry/cf-networking-release/pull/305">https://github.com/cloudfoundry/cf-networking-release/pull/305</a> Thanks @andy-a-d-nguyen! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.52.0...v3.53.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.52.0...v3.53.0</a>  ## Resources - [Download release 3.53.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.53.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.53.0</a>). </pre> |
| cflinuxfs3            | 0.417.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| cflinuxfs4            | 1.130.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub   | 2.12.98 | <p>▼ 2.12.98</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.97...2.12.98">https://github.com/pivotal/credhub-release/compare/2.12.97...2.12.98</a></pre> <p>▼ 2.12.97</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.96...2.12.97">https://github.com/pivotal/credhub-release/compare/2.12.96...2.12.97</a></pre> <p>▼ 2.12.96</p> <pre>## What's Changed * Features ** [feat: add back index on credential lowercase name] (<a href="https://github.com/cloudfoundry/credhub/commit/b7b4814a29ce1ff6a0bbde3ec52a7aa04812a0ef">https://github.com/cloudfoundry/credhub/commit/b7b4814a29ce1ff6a0bbde3ec52a7aa04812a0ef</a>) ** [by removing problematic mysql migration] (<a href="https://github.com/cloudfoundry/credhub/commit/34815e39b3deac933eb1f0ebeald4c38304178a5">https://github.com/cloudfoundry/credhub/commit/34815e39b3deac933eb1f0ebeald4c38304178a5</a>) * Various dependency bumps ## Known issue If you have successfully installed v2.12.94 (which is now retracted) and you are using MySQL as CredHub's database, to prevent potential performance issues, please run the following query against your MySQL database for CredHub: ``` DROP INDEX credential_name_lowercase ON credential; ``` This current CredHub release properly sets up similar indexes, and this old `credential_name_lowercase` index (added only by v2.12.94) has now become extraneous and wasteful. **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.95...2.12.96">https://github.com/pivotal/credhub-release/compare/2.12.95...2.12.96</a></pre> <p>▼ 2.12.95</p> <pre>## What's Changed * Fixes an issue in v2.12.94 (which is now retracted) where CredHub might fail to start due to MySQL migration error (see [details]) (<a href="https://github.com/cloudfoundry/credhub/pull/815">https://github.com/cloudfoundry/credhub/pull/815</a>)</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"><li>* As part of this fix, the MySQL [query performance improvement released in v2.12.94] (<a href="https://github.com/cloudfoundry/credhub/pull/803">https://github.com/cloudfoundry/credhub/pull/803</a>) has been rolled back (to be added back at a later release), but Postgres improvement stays.</li><li>* Various dependency bumps</li></ul> |
| diego     | 2.105.0 |                                                                                                                                                                                                                                                                                                                                                                                        |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.36  | <p>▼ 2.4.36</p> <pre>* Remove .NET 6.x that reached End of Support * Add .NET 9.0.0   name   version   cf_stacks    - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.11   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   9.0.0   cflinuxfs3, cflinuxfs4     dotnet-runtime   8.0.11   cflinuxfs3, cflinuxfs4     dotnet-runtime   9.0.0   cflinuxfs3, cflinuxfs4     dotnet-sdk   8.0.404   cflinuxfs3, cflinuxfs4     dotnet-sdk   9.0.100   cflinuxfs3, cflinuxfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4   Default binary versions:   name   version    - -   dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 64e0fcf8e25bc7336b5850808096a85db6693a009e5c1130ce455f00f1ad4ad0 * Uncached buildpack SHA256: 764600d5d03354b66adee9896f692883e45fb80ccb97800d977d9446e4f9f709</pre> |
|                               |         | <p>▼ 2.4.35</p> <pre>* Add dotnet-runtime 8.0.11, remove dotnet-runtime 8.0.10 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 6.0.36, remove dotnet-runtime 6.0.35 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 8.0.11, remove dotnet-aspnetcore 8.0.10 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 6.0.36, remove dotnet-aspnetcore 6.0.35 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 8.0.404, remove dotnet-sdk 8.0.403</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 6.0.428, remove dotnet-sdk 6.0.427 for stack(s) cflinuxfs4, cflinuxfs3 * This is planned to be the last buildpack release with .NET 6   name   version   cf_stacks    - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.36   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.11   cflinuxfs3, cflinuxfs4     dotnet-runtime   6.0.36   cflinuxfs3, cfl inuxfs4     dotnet-runtime   8.0.11   cflinuxfs3, cfl inuxfs4     dotnet-sdk   6.0.428   cflinuxfs3, cflinu xfs4     dotnet-sdk   8.0.404   cflinuxfs3, cflinu xfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4   Default binary versions:   name   version    -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 7a9b6c24fd6d83 8afa8d7695494d8b957ca96dc0ef7079032c207631145 ee0d1 * Uncached buildpack SHA256: fe68523aefce0a 80493051acf902b8cb0782eaa941b02466c6d318e6d2d 85053 </pre> |

#### ▼ 2.4.34

```

* Upgrade Sealights version to 1.5.0
* Add dotnet-sdk 6.0.427, remove dotnet-sdk
6.0.425
for stack(s) cflinuxfs4, cflinuxfs3
* Add dotnet-sdk 8.0.403, remove dotnet-sdk
8.0.401
for stack(s) cflinuxfs4, cflinuxfs3
* Add dotnet-aspnetcore 8.0.10, remove dotn
et-aspnetcore 8.0.8
for stack(s) cflinuxfs4, cflinuxfs3
* Add dotnet-aspnetcore 6.0.35, remove dotn
et-aspnetcore 6.0.33
for stack(s) cflinuxfs4, cflinuxfs3
* Add dotnet-runtime 6.0.35, remove dotnet-

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> runtime 6.0.33 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 8.0.10, remove dotnet- runtime 8.0.8 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.35   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.10   cflinuxfs3, cflinuxfs4     dotnet-runtime   6.0.35   cflinuxfs3, cf linuxfs4     dotnet-runtime   8.0.10   cflinuxfs3, cf linuxfs4     dotnet-sdk   6.0.427   cflinuxfs3, cfli nuxfs4     dotnet-sdk   8.0.403   cflinuxfs3, cfli nuxfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4   Default binary versions:   name   version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 7323fc34347295 29257d258365f6de8e38945127a6c2f5f74e3326576a8 cc133 * Uncached buildpack SHA256: 7ab7e182fe0ac2 a6d7fd36eb88eafaf247ffad75bb750c6264e067127561 aaaaaa </pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.64.0  | <p>▼ v1.64.0</p> <pre>## 1.64.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.63.0...v1.64.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.63.0...v1.64.0</a> ## Resources - [Download release 1.64.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.64.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.64.0</a>).</pre> |
|             |         | <p>▼ v1.63.0</p> <pre>## 1.63.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.62.0...v1.63.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.62.0...v1.63.0</a> ## Resources - [Download release 1.63.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.63.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.63.0</a>).</pre>                      |
|             |         | <p>▼ v1.62.0</p> <pre>## 1.62.0 **Release Date**: November 18, 2024 ## Changes - Bump golang ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.61.0...v1.62.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.61.0...v1.62.0</a> ## Resources - [Download release 1.62.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.62.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.62.0</a>).</pre>                           |
|             |         | <p>▼ v1.61.0</p> <pre>## 1.61.0 **Release Date**: November 14, 2024 ## Changes - Bump iptables to 1.8.11 ## Built with go 1.23.2</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.60.0...v1.61.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.60.0...v1.61.0</a></p> <ul style="list-style-type: none"> <li># # Resources <ul style="list-style-type: none"> <li>- [Download release 1.61.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.61.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.61.0</a>) .</li> </ul> </li> </ul>                                                                                                                         |
|           |         | <p>▼ v1.60.0</p> <p>## 1.60.0<br/> **Release Date**: November 07, 2024<br/> # # Changes<br/> - G115 fixes<br/> - Pin runc to 1.1.14<br/> # # Built with go 1.23.2<br/> **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.59.0...v1.60.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.59.0...v1.60.0</a></p> <p>## Resources <ul style="list-style-type: none"> <li>- [Download release 1.60.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.60.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.60.0</a>) .</li> </ul> </p> |
|           |         | <p>▼ v1.59.0</p> <p>## 1.59.0<br/> **Release Date**: October 30, 2024<br/> # # Changes<br/> - Update dependencies<br/> # # Built with go 1.23.2<br/> **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.58.0...v1.59.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.58.0...v1.59.0</a></p> <p>## Resources <ul style="list-style-type: none"> <li>- [Download release 1.59.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.59.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.59.0</a>) .</li> </ul> </p>                   |
|           |         | <p>▼ v1.58.0</p> <p>## 1.58.0<br/> **Release Date**: October 24, 2024<br/> # # Changes<br/> - Bump dependancies<br/> # # Built with go 1.23.2<br/> **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.57.0...v1.58.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.57.0...v1.58.0</a></p> <p>## Resources <ul style="list-style-type: none"> <li>- [Download release 1.58.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.58.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.58.0</a>) .</li> </ul> </p>                     |

| <b>Component</b>                | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |                | y/garden-runc-release?version=1.58.0).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| go-offline-buildpack            | 1.10.24        | <p>▼ 1.10.24</p> <pre>* Add go 1.22.9, remove go 1.22.7 for stack(s) cflinuxfs3, cflinuxfs4 * Add go 1.23.3, remove go 1.23.1 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - - -    dep   0.5.4   cflinuxfs3     dep   0.5.4   cflinuxfs4     glide   0.13.3   cflinuxfs3     glide   0.13.3   cflinuxfs4     go   1.22.9   cflinuxfs3     go   1.22.9   cflinuxfs4     go   1.23.3   cflinuxfs3     go   1.23.3   cflinuxfs4     godep   80   cflinuxfs3     godep   80   cflinuxfs4   Default binary versions:   name   version    - -    go   1.22.x   * Uncached buildpack SHA256: 92024d548e7d20 9d8917e5aa61715bf8d4c3824e1851b25176cc44b118d 9ac32 * Uncached buildpack SHA256: 60287b87753edc bc00ad3fad59c2cf9caf8e4307bc0471ac6c59017632 d4cd1</pre> |
| java-offline-buildpack          | 4.73.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| java-native-image-cnb-buildpack | 0.11.22        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component   | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache   | 3.1.7    | <p>▼ v3.1.7</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.10 * Bump ruby to ~3.1 in template tests by @ctlong in https://github.com/cloudfoundry/log-cache-release/pull/569 * Using xxhash v2 by @Jobsby in https://github.com/cloudfoundry/log-cache-release/pull/577  ## New Contributors * @Jobsby made their first contribution in https://github.com/cloudfoundry/log-cache-release/pull/577  **Full Changelog**: https://github.com/cloudfoundry/log-cache-release/compare/v3.1.6...v3.1.7 </pre> <p>▼ v3.1.6</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.8 * Modernize packaging scripts by @ctlong in https://github.com/cloudfoundry/log-cache-release/pull/468 * Update README to include descending parameter for /api/v1/read/ endpoint by @anetaivanova-pesheva in https://github.com/cloudfoundry/log-cache-release/pull/554 * Use Succeed() instead of BeNil() in tests by @acostall in https://github.com/cloudfoundry/log-cache-release/pull/568  ## New Contributors * @anetaivanova-pesheva made their first contribution in https://github.com/cloudfoundry/log-cache-release/pull/554  **Full Changelog**: https://github.com/cloudfoundry/log-cache-release/compare/v3.1.5...v3.1.6 </pre> |
| loggregator | 107.0.18 | <p>▼ v107.0.18</p> <pre> ## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.8 **Full Changelog**: https://github.com/cloudfoundry/loggregator-release/compare/v107.0.17...v107.0.18 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.3.2   | <p>▼ v8.3.2</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.10 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.1...v8.3.2">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.1...v8.3.2</a></pre></div> <p>▼ v8.3.1</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.0...v8.3.1">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.0...v8.3.1</a></pre></div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mapfs     | 1.12.0  | <p>▼ v1.12.0</p> <pre>## 1.12.0 **Release Date**: December 09, 2024 ## Changes - Dependency updates ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.11.0...v1.12.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.11.0...v1.12.0</a> ## Resources - [Download release 1.12.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.12.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.12.0</a>).</pre> |
|           |         | <p>▼ v1.11.0</p> <pre>## 1.11.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.10.0...v1.11.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.10.0...v1.11.0</a> ## Resources - [Download release 1.11.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.11.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.11.0</a>).</pre>  |
|           |         | <p>▼ v1.10.0</p> <pre>## 1.10.0 **Release Date**: December 02, 2024 ## Changes - Dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.9.0...v1.10.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.9.0...v1.10.0</a> ## Resources - [Download release 1.10.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.10.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.10.0</a>).</pre>     |
|           |         | <p>▼ v1.9.0</p> <pre>## 1.9.0 **Release Date**: November 27, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.8.0...v1.9.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.8.0...v1.9.0</a></pre>                                                                                                                                                                                                                                     |

| Component | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |          | <pre data-bbox="695 238 1329 417">dfoundry/mapfs-release/compare/v1.8.0...v1.9.0 ## Resources - [Download release 1.9.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.9.0).</pre>                                                                                                                                                                                                                                                                                                 |
|           | ▼ v1.8.0 | <pre data-bbox="695 552 1329 923">## 1.8.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/mapfs-release/compare/v1.7.0...v1.8.0 ## Resources - [Download release 1.8.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.8.0).</pre>                                                                                                                                                   |
|           | ▼ v1.7.0 | <pre data-bbox="695 1057 1329 1567">## 1.7.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. - Validate against integer overflows in mapfs's Chown() call - https://github.com/cloudfoundry/mapfs-release/pull/283 - Thanks @geofffranks ! ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/mapfs-release/compare/v1.6.0...v1.7.0 ## Resources - [Download release 1.7.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.7.0).</pre> |
|           | ▼ v1.6.0 | <pre data-bbox="695 1702 1329 2050">## 1.6.0 **Release Date**: October 31, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/mapfs-release/compare/v1.5.0...v1.6.0 ## Resources - [Download release 1.6.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.6.0).</pre>                                                                                                                                                |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |         | <p>y/mapfs-release?version=1.6.0).</p> <p>▼ v1.5.0</p> <pre>## 1.5.0 **Release Date**: October 24, 2024 ## Changes - Bump dependancies ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.4.0...v1.5.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.4.0...v1.5.0</a> ## Resources - [Download release 1.5.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.5.0).</pre> |
| metric-registrar | 4.0.5   | <p>▼ v4.0.5</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to gol.22.10</pre> <p>▼ v4.0.4</p> <pre>## What's Changed * Bump dependencies * Bump packaged golang to gol.22.8</pre>                                                                                                                                                                                                                                                                               |
| mysql-monitoring | 10.16.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats      | 56.32.0 | <p>▼ v56.32.0</p> <pre>## 56.32.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.31.0...v56.32.0">https://github.com/cloudfoundry/nats-release/compare/v56.31.0...v56.32.0</a> ## Resources - [Download release 56.32.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.32.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.32.0</a>).</pre>  |
|           |         | <p>▼ v56.31.0</p> <pre>## 56.31.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.30.0...v56.31.0">https://github.com/cloudfoundry/nats-release/compare/v56.30.0...v56.31.0</a> ## Resources - [Download release 56.31.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.31.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.31.0</a>).</pre> |
|           |         | <p>▼ v56.30.0</p> <pre>## 56.30.0 **Release Date**: December 02, 2024 ## Changes - dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.29.0...v56.30.0">https://github.com/cloudfoundry/nats-release/compare/v56.29.0...v56.30.0</a> ## Resources - [Download release 56.30.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.30.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.30.0</a>).</pre>  |
|           |         | <p>▼ v56.29.0</p> <pre>## 56.29.0 **Release Date**: November 26, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.28.0...v56.29.0">https://github.com/cloudfoundry/nats-release/compare/v56.28.0...v56.29.0</a></pre>                                                                                                                                                                                                                                     |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>dfoundry/nats-release/compare/v56.28.0...v56.29.0 ## Resources - [Download release 56.29.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.29.0).</pre>                                                                                                                                                                     |
|           |         | <p>▼ v56.28.0</p> <pre>## 56.28.0 **Release Date**: November 14, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/nats-release/compare/v56.27.0...v56.28.0 ## Resources - [Download release 56.28.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.28.0).</pre>   |
|           |         | <p>▼ v56.27.0</p> <pre>## 56.27.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/nats-release/compare/v56.26.0...v56.27.0 ## Resources - [Download release 56.27.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.27.0).</pre> |
|           |         | <p>▼ v56.26.0</p> <pre>## 56.26.0 **Release Date**: October 24, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/nats-release/compare/v56.25.0...v56.26.0 ## Resources - [Download release 56.26.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.26.0).</pre>  |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.13.0  | <p>▼ v7.13.0</p> <pre> ## 7.13.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.12.0...v7.13.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.12.0...v7.13.0</a> ## Resources - [Download release 7.13.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.13.0). </pre>                            |
|            |         | <p>▼ v7.12.0</p> <pre> ## 7.12.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4. ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.11.0...v7.12.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.11.0...v7.12.0</a> ## Resources - [Download release 7.12.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.12.0). </pre>                          |
|            |         | <p>▼ v7.11.0</p> <pre> ## 7.11.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps - OpenLDAP bumped to 2.6.9 ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.10.0...v7.11.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.10.0...v7.11.0</a> ## Resources - [Download release 7.11.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.11.0). </pre> |
|            |         | <p>▼ v7.10.0</p> <pre> ## 7.10.0 **Release Date**: November 27, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.3 </pre>                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.9.0...v7.10.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.9.0...v7.10.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"><li>- [Download release 7.10.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.10.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.10.0</a>).</li></ul> <p>▼ v7.9.0</p> <p>## 7.9.0</p> <p>**Release Date**: November 18, 2024</p> <p>## Changes</p> <ul style="list-style-type: none"><li>- Restart rpc group as asked by in man page s</li><li>- <a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1044">https://github.com/cloudfoundry/nfs-volume-release/pull/1044</a> - Thank you @krsna-m !</li><li>- Bump go</li><li>- Bump dependancies</li></ul> <p>## Built with go 1.23.3</p> <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.8.0...v7.9.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.8.0...v7.9.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"><li>- [Download release 7.9.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.9.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.9.0</a>).</li></ul> |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack | 1.2.20  | <p>▼ 1.2.20</p> <pre>* Add nginx 1.26.2, remove nginx 1.26.1 for stack(s) cflinuxfs4, cflinuxfs3 * Add nginx 1.27.2, remove nginx 1.27.1 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    nginx   1.26.2   cflinuxfs3     nginx   1.26.2   cflinuxfs4     nginx   1.27.2   cflinuxfs3     nginx   1.27.2   cflinuxfs4     openresty   1.21.4.3   cflinuxfs3     openresty   1.21.4.3   cflinuxfs4     openresty   1.25.3.2   cflinuxfs3     openresty   1.25.3.2   cflinuxfs4   Default binary versions:   name   version    -    nginx   1.27.x   * Uncached buildpack SHA256: 6c94c1e25fb799 a3c484ec8e7a977d1e93bfb06d00faf7b2b2397e147b4 ba52d * Uncached buildpack SHA256: 40f18e495af26c 02ea1ea02f1a5070af711f8dabbb35e64521d0abdb510 0dd32</pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.30  | <p>▼ 1.8.30</p> <pre>* Add node 22.11.0, remove node 22.7.0 for stack(s) cflinuxfs4 * Add node 20.18.0, remove node 20.15.1 for stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - - -   node   18.20.3   cflinuxfs3     node   18.20.3   cflinuxfs4     node   18.20.4   cflinuxfs3     node   18.20.4   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4     node   20.18.0   cflinuxfs3     node   20.18.0   cflinuxfs4     node   22.8.0   cflinuxfs4     node   22.11.0   cflinuxfs4     python   3.11.10   cflinuxfs3     python   3.11.10   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: e6e042aae67504 6afab18f70c2b07d769ca9105da91aa6831caffc5731f 0954e * Uncached buildpack SHA256: 07a76c3b804f3e d81208a2a7d3acf323756f093c60b1b3d753c6eaa3996 80e01</pre> |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications | 74.0.0  | <p>▼ v74.0.0</p> <pre> commit 682ca7f9aa4f51fdbb2a470b5508f8ee9201 af20 Author: PCF Toronto Concourse CI Bot Date:   Wed Nov 27 20:10:02 2024 +0000 Cuts final release 74.0.0 [ci skip] commit 37aa672afc55a7f3e22b2cf469a31f2c876 bd0e Merge: 8bf5ae9 ed4cfac Author: Benjamin Fuller Date:   Wed Nov 27 11:31:01 2024 -0700 Merge pull request #70 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/gomega-1.36.0 Bump github.com/onsi/gomega from 1.34.2 to 1.36.0 in /src/acceptance commit 8bf5ae9a8a6bc3eac21ed915896f66f040b6 e99f Merge: e28c5dc e934c50 Author: Benjamin Fuller Date:   Wed Nov 27 11:30:41 2024 -0700 Merge pull request #72 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/onsi/gomega-1.36.0 Bump github.com/onsi/gomega from 1.34.2 to 1.36.0 in /src/notifications commit ed4cfacc7f278ecaa1452d5b145fb58bde1d e8b6 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Wed Nov 27 18:29:01 2024 +0000 Bump github.com/onsi/gomega from 1.34.2 to 1.36.0 in /src/acceptance Bumps [github.com/onsi/gomega] (https://github.com/onsi/gomega) from 1.34.2 to 1.36.0. - [Release notes] (https://github.com/onsi/gomega/releases) - [Changelog] (https://github.com/onsi/gomega/blob/master/CHANGELOG.md) - [Commits] (https://github.com/onsi/gomega/compare/v1.34.2...v1.36.0) --- updated-dependencies: - dependency-name: github.com/onsi/gomega dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot] commit e934c50b4565b1099a49b7c6c493933f3dff 510d Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Wed Nov 27 18:28:37 2024 +0000 Bump github.com/onsi/gomega from 1.34.2 to 1.36.0 in /src/notifications </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>Bumps [github.com/onsi/gomega] (https://github.com/onsi/gomega) from 1.34.2 to 1.36.0.</p> <ul style="list-style-type: none"> <li>- [Release notes] (https://github.com/onsi/gomega/releases)</li> <li>- [Changelog] (https://github.com/onsi/gomega/blob/master/CHANGELOG.md)</li> <li>- [Commits] (https://github.com/onsi/gomega/compare/v1.34.2...v1.36.0)</li> </ul> <p>---</p> <p>updated-dependencies:</p> <ul style="list-style-type: none"> <li>- dependency-name: github.com/onsi/gomega</li> <li>dependency-type: direct:production</li> <li>update-type: version-update:semver-minor</li> <li>...</li> </ul> <p>Signed-off-by: dependabot[bot]</p> <p>commit e28c5dce83ebe7682b6eeaed070a500a3e412ae6</p> <p>Merge: b71adb7 d38aaae</p> <p>Author: Benjamin Fuller</p> <p>Date: Wed Nov 27 11:27:52 2024 -0700</p> <p>Merge pull request #71 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/ginkgo/v2-2.22.0</p> <p>Bump github.com/onsi/ginkgo/v2 from 2.20.2 to 2.22.0 in /src/acceptance</p> <p>commit b71adb7dc27d18a9cc110c7dc33968b630c8f82</p> <p>Merge: 9e11702 a68798c</p> <p>Author: Benjamin Fuller</p> <p>Date: Wed Nov 27 11:27:23 2024 -0700</p> <p>Merge pull request #73 from cloudfoundry/dependabot/go_modules/src/notifications/github.com/onsi/ginkgo/v2-2.22.0</p> <p>Bump github.com/onsi/ginkgo/v2 from 2.20.2 to 2.22.0 in /src/notifications</p> <p>commit 9e11702132ec1b2d1acb8b54d0bc7df0ae45b354</p> <p>Merge: f9b9cab 3b5a802</p> <p>Author: Evan Farrar</p> <p>Date: Wed Nov 27 10:02:53 2024 -0800</p> <p>Merge pull request #75 from cloudfoundry/move-blobstore</p> <p>move blobstore to gcs</p> <p>commit 3b5a802530296a3d46ca6d7dffde88c092456008</p> <p>Author: Ben Fuller</p> <p>Date: Wed Nov 27 10:58:30 2024 -0700</p> <p>move blobstore to gcs</p> <p>commit a68798cce1b5326f83f9795eb8c0f8f0db0ca1d0</p> <p>Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;</p> <p>Date: Mon Nov 25 23:11:03 2024 +0000</p> <p>Bump github.com/onsi/ginkgo/v2 in /src/notifications</p> <p>Bumps [github.com/onsi/ginkgo/v2] (https://github.com/onsi/ginkgo) from 2.20.2 to 2.22.0.</p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>- [Release notes] (<a href="https://github.com/onsi/ginkgo/releases">https://github.com/onsi/ginkgo/releases</a>)</li> <li>- [Changelog] (<a href="https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md">https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md</a>)</li> <li>- [Commits] (<a href="https://github.com/onsi/ginkgo/compare/v2.20.2...v2.22.0">https://github.com/onsi/ginkgo/compare/v2.20.2...v2.22.0</a>) <ul style="list-style-type: none"> <li>---</li> <li>updated-dependencies:</li> <li>- dependency-name: <a href="https://github.com/onsi/ginkgo/v2">github.com/onsi/ginkgo/v2</a> <ul style="list-style-type: none"> <li>dependency-type: direct:production</li> <li>update-type: version-update:semver-minor</li> <li>...</li> <li>Signed-off-by: dependabot[bot]</li> <li>commit f9b9cabell1654627b897beec31bae137962106e4 <ul style="list-style-type: none"> <li>Merge: 122b2dc a83b5a6</li> <li>Author: Evan Farrar</li> <li>Date: Mon Nov 25 15:09:57 2024 -0800</li> <li>Merge pull request #69 from cloudfoundry/integrate-submodule</li> <li>integrate submodule</li> <li>commit d38aaaef6293d4358a280690e8907f41bfd3bf91 <ul style="list-style-type: none"> <li>Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;</li> <li>Date: Mon Nov 25 22:30:52 2024 +0000</li> <li>Bump <a href="https://github.com/onsi/ginkgo/v2">github.com/onsi/ginkgo/v2</a> from 2.20.2 to 2.22.0 in /src/acceptance</li> <li>Bumps <a href="https://github.com/onsi/ginkgo/v2">[github.com/onsi/ginkgo/v2]</a> (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>) from 2.20.2 to 2.22.0.</li> <li>- [Release notes] (<a href="https://github.com/onsi/ginkgo/releases">https://github.com/onsi/ginkgo/releases</a>)</li> <li>- [Changelog] (<a href="https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md">https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md</a>)</li> <li>- [Commits] (<a href="https://github.com/onsi/ginkgo/compare/v2.20.2...v2.22.0">https://github.com/onsi/ginkgo/compare/v2.20.2...v2.22.0</a>) <ul style="list-style-type: none"> <li>---</li> <li>updated-dependencies:</li> <li>- dependency-name: <a href="https://github.com/onsi/ginkgo/v2">github.com/onsi/ginkgo/v2</a> <ul style="list-style-type: none"> <li>dependency-type: direct:production</li> <li>update-type: version-update:semver-minor</li> <li>...</li> <li>Signed-off-by: dependabot[bot]</li> <li>commit a83b5a6fde9afc5930eadd75df9a2825fe0ddb92 <ul style="list-style-type: none"> <li>Author: Ben Fuller</li> <li>Date: Mon Nov 25 13:08:14 2024 -0700</li> <li>integrate submodule</li> <li>commit 122b2dcf62d4fc1acebd7354226f4ebc8cca1b5d <ul style="list-style-type: none"> <li>Author: PCF Event Alerts Team CI</li> <li>Date: Fri Nov 15 20:12:14 2024 +0000</li> <li>bump-golang to v0.159.0</li> <li>commit a98da85050ccc15867eb461d6362196d1a647972</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li></ul></li></ul> |

| Component | Version | Release Notes                                                                                                                                                                                                                                    |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>Author: Benjamin Fuller Date: Mon Oct 7 11:48:38 2024 -0600 paramaterize vm type (#66) commit 4fa39a24439a2914528bb3d52b62908daa60 24d4  Author: PCF Event Alerts Team CI Date: Tue Oct 1 18:02:27 2024 +0000 bump-golang to v0.158.0</pre> |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications-ui | 51.0.0  | <p>▼ v51.0.0</p> <pre> commit 5bb855e8a92447fe11d4519f98bac77fccea 82b6 Author: PCF Event Alerts Team CI Date:   Wed Nov 27 20:22:32 2024 +0000 Cuts final release 51.0.0 [ci skip] commit f4b426534c2f8fcbe91bec2e8c60a162e5fb 8e2a Merge: c0f0142 4a64ab0 Author: Ben Fuller Date:   Wed Nov 27 11:47:32 2024 -0700 Merge pull request #5 from TNZ/renovate/git hub.com-puerkitobio-goquery-1.x Update module github.com/PuerkitoBio/goquer y to v1.10.0 commit 4a64ab09bff1d65a9cedec394c290c04a670 5a6a Author: Renovate Bot Date:   Wed Nov 27 18:34:48 2024 +0000 Update module github.com/PuerkitoBio/goquer y to v1.10.0 commit c0f0142c60b54ea42b88533cf524c6956fe9 9137 Author: Ben Fuller Date:   Wed Nov 27 11:20:05 2024 -0700 update renovate commit 52fa309f02a52f46cb037f6e47dc0bb99c74 3534 Author: Ben Fuller Date:   Wed Nov 27 10:44:38 2024 -0700 move to gcs commit 0b58b7e382d4539c8de90b6295dd6d7de778 d0dd Author: Ben Fuller Date:   Mon Nov 25 10:40:03 2024 -0700 remove github actions from submodule - will need to change these to mainline commit a3bbe801183345dcale61ea1362055eba4e1 cdc8 Author: Ben Fuller Date:   Mon Nov 25 10:39:26 2024 -0700 remove incorporate code submodule commit 57b5276f05e52144ad1d48602d5586fcbe61 1440 Author: PCF Event Alerts Team CI Date:   Fri Nov 15 20:12:02 2024 +0000 bump-golang to v0.159.0 commit 908c7f607dbbf83e4cdb0aca1d075989fbf eb6e Author: Ben Fuller Date:   Mon Oct 7 11:42:51 2024 -0600 parameterize vm_type commit f7fe4fa62db352a25f7c6c4b31853a67276c 500b Author: PCF Event Alerts Team CI </pre> |

| Component      | Version | Release Notes                                                  |
|----------------|---------|----------------------------------------------------------------|
|                |         | Date: Tue Oct 1 18:02:26 2024 +0000<br>bump-golang to v0.158.0 |
| otel-collector | 0.10.1  |                                                                |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.25  | <p>▼ 4.6.25</p> <pre>* Add composer 2.8.2, remove composer 2.7.8 for stack(s) cflinuxfs4, cflinuxfs3 * Add nginx 1.27.2, remove nginx 1.27.1 for stack(s) cflinuxfs3, cflinuxfs4 * Add php 8.1.29, remove php 8.1.27 for stack(s) cflinuxfs3, cflinuxfs4 * Add php 8.3.11, remove php 8.3.9 for stack(s) cflinuxfs4, cflinuxfs3 * Add php 8.2.24, remove php 8.2.21 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks   modules    - - - -    appdynamics   23.11.0-839   cflinuxfs3, cflinuxfs4       composer   2.8.2   cflinuxfs3, cflinuxfs4       httpd   2.4.62   cflinuxfs3       httpd   2.4.62   cflinuxfs4       newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4       nginx   1.26.2   cflinuxfs3       nginx   1.26.2   cflinuxfs4       nginx   1.27.2   cflinuxfs3       nginx   1.27.2   cflinuxfs4       php   8.1.29   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.29   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.30   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib  </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>th, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib  </p> <p>  php   8.1.30   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib  </p> <p>  php   8.2.23   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.2.23   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.2.24   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  php   8.2.24   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.10   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.10   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.11   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.11   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap,</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     python   3.12.4   cflinuxfs3       python   3.12.4   cflinuxfs4       ruby   3.0.5   cflinuxfs4     Default binary versions:   name   version    - -    php   8.1.30     httpd   2.4.62     newrelic   10.21.0.11     nginx   1.27.2     composer   2.8.2   * Uncached buildpack SHA256: 775175df334c3ed8044db41d002150208d905cb0ad8e13ff5397dc0ca86ae294 * Uncached buildpack SHA256: 5baaddef0f430927f2a14c257ec3703a17e521195c04c8fa4797792d3ff3a7b</pre> |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release | 677.0.64 | <p>▼ 677.0.64</p> <pre>* create new release to handle bosh compilation errors caused by previous version of bosh</pre> <p>▼ 677.0.63</p> <pre>## What's Changed * update dependencies * separation of api per page configuration between apps manager and search server</pre> <p>▼ 677.0.62</p> <pre>* add new forms of validation for creating service instances * raise async queue limit, allowing apps-manager to make more requests to backend quicker</pre> <p>▼ 677.0.61</p> <pre>* fix padding of spring logging modal * fix spring logging modal for to respect the levels that are presented by the spring application. For example, if only "OFF" and "DEBUG" are available, it won't present a button to attempt to set the logging level to "ERROR".</pre> |
| push-offline-docs-release | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.137 | <p>▼ v674.0.137</p> <pre>## Changes * chore: no longer do all on version pushes * creating final release 674.0.136 * move to shared vault location</pre> <p>▼ v674.0.136</p> <pre>## Changes * creating final release 674.0.135</pre> <p>▼ v674.0.135</p> <pre>## Changes * Add renovate bot * Merge pull request #10 from TNZ/renovate-bot * add submodule support to renovate * creating final release 674.0.134 * fix: echo out env * fix: hopefully fix renovate endpoint cert error * fix: remove dashboard approval * fix: remove dryrun * fix: remove github proxy * fix: remove package rules * fix: still hitting github.com * fix: submodule clone and secret * fix: try only git submodules</pre> <p>▼ v674.0.134</p> <pre>## Changes * creating final release 674.0.133</pre> <p>▼ v674.0.132</p> <pre>## Changes * Fix constraint issue for USAGE-83 (#8) * creating final release 674.0.131</pre> <p>▼ v674.0.131</p> <pre>## Changes * Bump usage service (#7) * creating final release 674.0.130</pre> <p>▼ v674.0.130</p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## Changes * Merge pull request #6 from TNZ/usage-83 * bump app usage service * creating final release 674.0.129 </pre> <p>▼ v674.0.129</p> <pre> ## Changes * Merge branch 'main' into snookala/TPCF-27 343 * Merge branch 'main' into snookala/TPCF-27 343 * Merge branch 'snookala/TPCF-27343' of htt ps://github.gwd.broadcom.net/TNZ/usage-servic e-release into snookala/TPCF-27343 * Merge pull request #5 from TNZ/snookala/T PCF-27343 * TPCF-27343 - Switch Usage-service to tas- lite * Update app-usage-service * creating final release 674.0.128 </pre> <p>▼ v674.0.128</p> <pre> ## Changes * creating final release 674.0.127 </pre> <p>▼ v674.0.127</p> <pre> ## Changes * creating final release 674.0.126 </pre> <p>▼ v674.0.126</p> <pre> ## Changes * Update the URL for OCI images * creating final release 674.0.125 </pre> <p>▼ v674.0.125</p> <pre> ## Changes * Revert "fix: fix submodule for pipelines" * add ability to configure memory for servi </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>ces (#1)   * creating final release 674.0.124   * fix: fix submodule for pipelines   * fix: fix submodule url for pipelines   * remove username from pr resource, not needed. Add description to shepherd claims  ▼ v674.0.124  ## Changes * Change URLs to point to the new github on-prem instance   * Merge pull request #601 from pivotal-cf/dependabot/submodules/main/src/app-usage-service-827883c   * Merge pull request #602 from pivotal-cf/migration-on-prem     * creating final release 674.0.123 ## Dependencies * **app-usage-service:** Updated to v`827883c`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pxc       | 1.0.33  | <p>▼ v1.0.33</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Dependency bumps</p> <ul style="list-style-type: none"> <li>* Bump Go to v1.23.4</li> <li>* Bumps Percona XtraDB Cluster to v8.0.39-30</li> </ul> <p>Note: This version of Percona XtraDB Cluster addresses a serious issue with data loss when using <code>inplace</code> <code>ALTER TABLE</code>.<br/>See: [PS-9214] (<a href="https://perconadev.atlassian.net/browse/PS-9214">https://perconadev.atlassian.net/browse/PS-9214</a>) and [this blog post] (<a href="https://www.percona.com/blog/who-ate-my-mysql-table-rows/">https://www.percona.com/blog/who-ate-my-mysql-table-rows/</a>)</p> </div> <p>▼ v1.0.32</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Release Notes **Bugs Fixed** - Fix a memory leak bug in the Percona audit log plugin when `engine_config.audit_logs.enabled` is configured  Previously, when the audit log feature was enabled and long-lived connections that heavily used prepared statement were used, memory could grow linearly over time and lead to the Linux OOM killer terminating MySQL.  This backports a fix from [PS-9369] (<a href="https://perconadev.atlassian.net/browse/PS-9369">http://perconadev.atlassian.net/browse/PS-9369</a>) to address a memory leak for workloads that heavily use long-lived connections and prepared statements with audit logs enabled.  **Dependency bumps** - Bump Go to v1.23.3 - Updates packages and dependencies</pre> </div> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.30  | <p>▼ 1.8.30</p> <pre>* Add python 3.13.0, remove python 3.8 for stack(s) cflinuxfs4, cflinuxfs3 * Add pip 24.3.1, remove pip 24.2 for stack(s) cflinuxfs4, cflinuxfs3 * Add setuptools 75.3.0, remove setuptools 75.1.0 for stack(s) cflinuxfs4, cflinuxfs3 * Update pipenv to 2024.4.0 for stack(s) cflinuxfs3, cflinuxfs4 * Add python 3.12.7, remove python 3.12.6 for stack(s) cflinuxfs4, cflinuxfs3 * Updated setuptools to 75.1.0 for stack(s) cflinuxfs4, cflinuxfs3 * Add python 3.10.15, remove python 3.10.14 for stack(s) cflinuxfs4, cflinuxfs3 * Add python 3.9.20, remove python 3.9.19 for stack(s) cflinuxfs3, cflinuxfs4 * Add python 3.8.20, remove python 3.8.19 for stack(s) cflinuxfs4, cflinuxfs3 * Add python 3.12.6, remove python 3.12.5 for stack(s) cflinuxfs3, cflinuxfs4 * Add python 3.11.10, remove python 3.11.9 for stack(s) cflinuxfs4, cflinuxfs3 * Add support for the SL_VERSION env var in the Sealights configuration.   name   version   cf_stacks    - -    libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniforge   24.7.1   cflinuxfs3, cflinuxfs4     pip   24.3.1   cflinuxfs3, cflinuxfs4     pipenv   2024.4.0   cflinuxfs3     pipenv   2024.4.0   cflinuxfs4     python   3.9.20   cflinuxfs3     python   3.9.20   cflinuxfs4     python   3.10.15   cflinuxfs3     python   3.10.15   cflinuxfs4     python   3.11.10   cflinuxfs3     python   3.11.10   cflinuxfs4     python   3.12.7   cflinuxfs3     python   3.12.7   cflinuxfs4     python   3.13.0   cflinuxfs3     python   3.13.0   cflinuxfs4     setuptools   75.3.0   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    python   3.10.x   * Uncached buildpack SHA256: bd620a637291ac b19d0535fd69126bf3054b564e431634ff959e0e90c16 67b6e * Uncached buildpack SHA256: a9dc0d6f92bc05</pre> |

| <b>Component</b>    | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                | 1d611a48edb4ef438dd0b6709b8bd4a75df34a69ec173<br>ecaaff                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| r-offline-buildpack | 1.2.16         | <p>▼ 1.2.16</p> <pre>* go.mod: update go version   name   version   cf_stacks   modules    - - -    r   4.2.3   cflinuxfs3   forecast, plumber, rserv   r   4.2.3   cflinuxfs4   forecast, plumber, rserv, shiny     r   4.3.3   cflinuxfs3   forecast, plumber, rserv, shiny     r   4.3.3   cflinuxfs4   forecast, plumber, rserv, shiny     r   4.4.1   cflinuxfs3   forecast, plumber, rserv, shiny     r   4.4.1   cflinuxfs4   forecast, plumber, rserv, shiny   * Uncached buildpack SHA256: d5698a7eeee8b81a27f25708d523b69b42cc3578cfa962eb27838bdc56d73d14 * Uncached buildpack SHA256: 243b87da596e742c8c9438877d4229cd44f7ec3470933f0d4ff692e10bd535bf</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.325.0 | <p>▼ v0.325.0</p> <pre>## 0.325.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.324.0...v0.325.0">https://github.com/cloudfoundry/routing-release/compare/v0.324.0...v0.325.0</a> ## Resources - [Download release 0.325.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.325.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.325.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|           |         | <p>▼ v0.324.0</p> <pre>## 0.324.0 **Release Date**: December 05, 2024 ## Changes - [Upgrade routing-healthchecker] (<a href="https://github.com/cloudfoundry/routing-release/commit/d429341973f55be5f69e57176ee9c971fb2cf375">https://github.com/cloudfoundry/routing-release/commit/d429341973f55be5f69e57176ee9c971fb2cf375</a>) - [Upgrade golang-1.23-linux (1.23.4)] (<a href="https://github.com/cloudfoundry/routing-release/commit/8fb1521593bb8aa9881aa3206c42a5a1bfefbfd1">https://github.com/cloudfoundry/routing-release/commit/8fb1521593bb8aa9881aa3206c42a5a1bfefbfd1</a>) ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.323.0...v0.324.0">https://github.com/cloudfoundry/routing-release/compare/v0.323.0...v0.324.0</a> ## Resources - [Download release 0.324.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.324.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.324.0</a>).</pre> |
|           |         | <p>▼ v0.323.0</p> <pre>## 0.323.0 **Release Date**: December 02, 2024 ## Changes - Dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.322.0...v0.323.0">https://github.com/cloudfoundry/routing-release/compare/v0.322.0...v0.323.0</a> ## Resources - [Download release 0.323.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.323.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.323.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|           |         | <p>▼ v0.322.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## 0.322.0 **Release Date**: November 27, 2024 ## Changes - Various minor dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.321.0...v0.322.0">https://github.com/cloudfoundry/routing-release/compare/v0.321.0...v0.322.0</a> ## Resources - [Download release 0.322.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.322.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.322.0</a>). </pre> <p>▼ v0.321.0</p> <pre> ## 0.321.0 **Release Date**: November 18, 2024 ## Changes - Add bosh properties for additional header (request and response) limits - <a href="https://github.com/cloudfoundry/routing-release/issues/309">https://github.com/cloudfoundry/routing-release/issues/309</a>, <a href="https://github.com/cloudfoundry/routing-release/pull/443">https://github.com/cloudfoundry/routing-release/pull/443</a>, <a href="https://github.com/cloudfoundry/gorouter/pull/453">https://github.com/cloudfoundry/gorouter/pull/453</a> - Thanks @maxmoehl ! - Bump Go - Bump dependancies ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index c7896a27..cdebbd5a 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -266,12 +266,41 @@ properties: description: "Enforce strict validation of a route service signature" default: false router.max_header_kb: +   description:   +     Deprecated, use router.max_request_header_kb instead which is equivalent to this option. +   default: 1024 # 1Mb +   router.max_request_header_kb: description:   This value controls the maximum number of bytes (in KB) the gorouter will read parsing the request header's keys and values, including the request line. It does not limit the size of the request body. Requests with larger headers will result in a 431 status code. Must be between 1 and 1024kb. -   default: 1024 # 1Mb +   Note: This value takes precedence over router.max_header_kb but has no default </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> to not break +           existing setups. If you previously configured router.max_header_kb it is recomme nded to +           switch to this property instead. +           example: 1024 # 1Mb +           router.max_response_header_kb: +           description:   +               This value controls the maximum nu mber of bytes (in KB) the gorouter will read +               parsing the response header's keys and values, including the request +               line. It does not limit the size o f the response body. Responses with +               larger headers will result in a 50 2 status code. A limit of zero or less will +               result in the default GoLang limit being used. +           default: 0 +           router.max_request_headers: +           description:   +               This value controls the maximum nu mber of headers gorouter will accept in a +               single request. Only the header ke ys are counted and values separated by commas +               are not considered additional head ers. Setting this to zero or less disables th e +               limit. Must be at least 30 for CF to function properly (enforced). +           default: 0 +           router.max_response_headers: +           description:   +               This value controls the maximum nu mber of headers gorouter will accept in a +               single response. Only the header k eys are counted and values separated by comma s +               are not considered additional head ers. Setting this to zero or less disables th e +               limit. Must be at least 30 for CF to function properly (enforced). +           default: 0 router.extra_headers_to_log: description: "An array of headers that acce ss log events will be annotated with. This on ly applies to headers on requests." default: [] ``` ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/clou dfoundry/routing-release/compare/v0.320.0...v 0.321.0">https://github.com/cloudfoundry/routing-releas e/compare/v0.320.0...v0.321.0</a> ## Resources - [Download release 0.321.0 from bosh.io](h <a href="https://bosh.io/releases/github.com/cloudfound y/routing-release/v0.321.0">https://bosh.io/releases/github.com/cloudfound y/routing-release/v0.321.0</a>)</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ry/routing-release?version=0.321.0).</p> <p>▼ v0.320.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## 0.320.0 **Release Date**: November 15, 2024 ## Changes - Upgrade routing-healthchecker ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.319.0...v0.320.0">https://github.com/cloudfoundry/routing-release/compare/v0.319.0...v0.320.0</a> ## Resources - [Download release 0.320.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.320.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.320.0</a>).</pre></div> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack    | 1.10.19 | <p>▼ 1.10.19</p> <pre>* Add bundler 2.5.20, remove bundler 2.5.18 for stack(s) cflinuxfs4, cflinuxfs3 * Add rubygems 3.5.21, remove rubygems 3.5. 18 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - - -   bundler   2.5.20   cflinuxfs3, cflinuxfs4     jruby   9.4.8.0   cflinuxfs3     jruby   9.4.8.0   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.5   cflinuxfs3     ruby   3.1.5   cflinuxfs4     ruby   3.1.6   cflinuxfs3     ruby   3.1.6   cflinuxfs4     ruby   3.2.4   cflinuxfs3     ruby   3.2.4   cflinuxfs4     ruby   3.2.5   cflinuxfs3     ruby   3.2.5   cflinuxfs4     ruby   3.3.2   cflinuxfs3     ruby   3.3.2   cflinuxfs4     ruby   3.3.4   cflinuxfs3     ruby   3.3.4   cflinuxfs4     rubygems   3.5.21   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    ruby   3.2.x   * Uncached buildpack SHA256: 0412f24e611320 324500371eafa96a25548c742d16e11087d7fe8431aa7 a48b7 * Uncached buildpack SHA256: cea78370e5511e 313e0c7d6ff0c183f9b6abe34ca4eed11e16e8fd79036 57fd1</pre> |
| web-servers-cnb-buildpack | 0.15.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.60.0  | <p>▼ v3.60.0</p> <pre>## 3.60.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.59.0...v3.60.0">https://github.com/cloudfoundry/silk-release/compare/v3.59.0...v3.60.0</a> ## Resources - [Download release 3.60.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.60.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.60.0</a>).</pre>                       |
|           |         | <p>▼ v3.59.0</p> <pre>## 3.59.0 **Release Date**: December 04, 2024 ## Changes - Upgrade silk-healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.58.0...v3.59.0">https://github.com/cloudfoundry/silk-release/compare/v3.58.0...v3.59.0</a> ## Resources - [Download release 3.59.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.59.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.59.0</a>).</pre>             |
|           |         | <p>▼ v3.58.0</p> <pre>## 3.58.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.57.0...v3.58.0">https://github.com/cloudfoundry/silk-release/compare/v3.57.0...v3.58.0</a> ## Resources - [Download release 3.58.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.58.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.58.0</a>).</pre> |
|           |         | <p>▼ v3.57.0</p> <pre>## 3.57.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.3</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component | Version          | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                  | <pre>**Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.56.0...v3.57.0">https://github.com/cloudfoundry/silk-release/compare/v3.56.0...v3.57.0</a> ## Resources - [Download release 3.57.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.57.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.57.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                         |
|           | <b>▼ v3.56.0</b> | <pre>## 3.56.0 **Release Date**: November 18, 2024 ## Changes - [Upgrade silk-healthchecker] (<a href="https://github.com/cloudfoundry/silk-release/commit/9a64b05ce674243a2b738d0253407661a03b1159">https://github.com/cloudfoundry/silk-release/commit/9a64b05ce674243a2b738d0253407661a03b1159</a>) - Bump Go - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.55.0...v3.56.0">https://github.com/cloudfoundry/silk-release/compare/v3.55.0...v3.56.0</a> ## Resources - [Download release 3.56.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.56.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.56.0</a>).</pre> |
|           | <b>▼ v3.55.0</b> | <pre>## 3.55.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.54.0...v3.55.0">https://github.com/cloudfoundry/silk-release/compare/v3.54.0...v3.55.0</a> ## Resources - [Download release 3.55.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.55.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.55.0</a>).</pre>                                                                                                                                                                                                                                                     |
|           | <b>▼ v3.54.0</b> | <pre>## 3.54.0 **Release Date**: November 05, 2024 ## Changes - [Address integer overflows when downcasting for G115] (<a href="https://github.com/cloudfoundry/silk-release/commit/58a8d27d505cc0cc8f69ed91a35d9cbcc8cc9c46">https://github.com/cloudfoundry/silk-release/commit/58a8d27d505cc0cc8f69ed91a35d9cbcc8cc9c46</a>) - [Address integer overflows when downcasting for G115] (<a href="https://github.com/cloudfoundry/silk-release/pull/145">https://github.com/cloudfoundry/silk-release/pull/145</a>)</pre>                                                                                                                                                                                                                                                           |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>- [add retry logic for LinkList and AddrList netlink calls in cni] (<a href="https://github.com/cloudfoundry/silk-release/commit/2f280324816cef03771099b1a34552d35d4cb55e">https://github.com/cloudfoundry/silk-release/commit/2f280324816cef03771099b1a34552d35d4cb55e</a>)</li> <li>- [Retry with backoff tests] (<a href="https://github.com/cloudfoundry/silk-release/commit/f0ebfc864d0588f39765c9c38e30aacb1dce7588">https://github.com/cloudfoundry/silk-release/commit/f0ebfc864d0588f39765c9c38e30aacb1dce7588</a>)</li> <li>- [Add retry logic for LinkList and AddrList netlink calls in cni #147] (<a href="https://github.com/cloudfoundry/silk-release/pull/147">https://github.com/cloudfoundry/silk-release/pull/147</a>)</li> </ul> <p>## Built with go 1.23.2</p> <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.53.0...v3.54.0">https://github.com/cloudfoundry/silk-release/compare/v3.53.0...v3.54.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"> <li>- [Download release 3.54.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.54.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.54.0</a>).</li> </ul> <p>▼ v3.53.0</p> <pre> ## 3.53.0 **Release Date**: October 22, 2024 ## Changes - Bump dependancies ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.52.0...v3.53.0">https://github.com/cloudfoundry/silk-release/compare/v3.52.0...v3.53.0</a> ## Resources - [Download release 3.53.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.53.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.53.0</a>). </pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume | 3.13.0  | <p>▼ v3.13.0</p> <pre> ## 3.13.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.12.0...v3.13.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.12.0...v3.13.0</a> ## Resources - [Download release 3.13.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.13.0). </pre>  |
|            |         | <p>▼ v3.12.0</p> <pre> ## 3.12.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.11.0...v3.12.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.11.0...v3.12.0</a> ## Resources - [Download release 3.12.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.12.0). </pre> |
|            |         | <p>▼ v3.11.0</p> <pre> ## 3.11.0 **Release Date**: December 02, 2024 ## Changes - Dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.10.0...v3.11.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.10.0...v3.11.0</a> ## Resources - [Download release 3.11.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.11.0). </pre>  |
|            |         | <p>▼ v3.10.0</p> <pre> ## 3.10.0 **Release Date**: November 27, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.9.0...v3.10.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.9.0...v3.10.0</a> </pre>                                                                                                                                         |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |         | <pre>dfoundry/smb-volume-release/compare/v3.9.0... v3.10.0 ## Resources - [Download release 3.10.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.10.0).</pre>                                                                                                                                                                                                                                                                                                                                      |
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| staticfile-offline-buildpack | 1.6.18  | <p>▼ 1.6.18</p> <pre>* Add nginx 1.27.2, remove nginx 1.27.1 for stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - - -   nginx   1.26.2   cflinuxfs3     nginx   1.26.2   cflinuxfs4     nginx   1.27.2   cflinuxfs3     nginx   1.27.2   cflinuxfs4    Default binary versions:   name   version    - -   nginx   1.27.x   * Uncached buildpack SHA256: 8f6510b6242493 6a81ab5dc38dba67b0117f25d8d76ffc60e8af0cc747 5dc6c * Uncached buildpack SHA256: 8d23de078ea9d7 77b5ac75b1d83834d778557c79928fdb5a5ad2da81c52 d719e</pre> |
| statsd-injector              | 1.11.45 | <p>▼ v1.11.45</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.10 **Full Changelog**: https://github.com/cloudfoundry/statsd-injector-release/compare/v1.1 1.44...v1.11.45</pre> <p>▼ v1.11.44</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.9 **Full Changelog**: https://github.com/cloudfoundry/statsd-injector-release/compare/v1.1 1.43...v1.11.44</pre>                                                                                                                   |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| syslog                 | 12.3.5  | <p>▼ v12.3.5</p> <pre>## What's Changed * Bump dependencies * bump packaged Golang to go1.22.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.4...v12.3.5">https://github.com/cloudfoundry/syslog-release/compare/v12.3.4...v12.3.5</a></pre> <p>▼ v12.3.4</p> <pre>## What's Changed * Fix syslog_storer write permissions in Noble stemcells with new apparmor rules by @ramonskie in <a href="https://github.com/cloudfoundry/syslog-release/pull/188">https://github.com/cloudfoundry/syslog-release/pull/188</a> * Bump packaged Golang to go1.22.8 * Bump blackbox dependencies ## New Contributors * @ramonskie made their first contribution in <a href="https://github.com/cloudfoundry/syslog-release/pull/188">https://github.com/cloudfoundry/syslog-release/pull/188</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.3...v12.3.4">https://github.com/cloudfoundry/syslog-release/compare/v12.3.3...v12.3.4</a></pre> |
| system-metrics-scraper | 4.0.13  | <p>▼ v4.0.13</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.10 **Full Changelog**: <a href="https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.12...v4.0.13">https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.12...v4.0.13</a></pre> <p>▼ v4.0.12</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.11...v4.0.12">https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.11...v4.0.12</a></pre>                                                                                                                                                                                                                                                                                                                                                                         |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa       | 77.20.0 | <p>▼ v77.20.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.20.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.20.0) ### Dependency Bumps * Bump github.com/cloudfoundry/bosh-utils from 0.0.502 to 0.0.503 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/982 * Bump minitest from 5.25.1 to 5.25.2 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/983 * Bump github.com/cloudfoundry/bosh-utils from 0.0.503 to 0.0.504 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/985 * Bump github.com/onsi/gomega from 1.35.1 to 1.36.0 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/986 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.19.0...v77.20.0 </pre> <p>▼ v77.19.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.19.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.19.0) ### Fixes * [CVE-2024-52318] (https://tomcat.apache.org/security-9.html#Fixed_in_Apache_Tomcat_9.0.97) [Upgrade Tomcat to version 9.0.97] (https://github.com/cloudfoundry/uaa-release/commit/89024263bef1cc3838ccb2b3e018832a3be35fc4) * [CVE-2024-38827] (https://spring.io/security/cve-2024-38827) in [Spring Security] (https://github.com/cloudfoundry/uaa/pull/3142) ### Dependency Bumps * Bump activesupport from 7.2.1.1 to 7.2.1.2 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/972 * Bump github.com/onsi/gomega from 1.34.2 to 1.35.0 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/973 * Bump github.com/onsi/gomega from 1.35.0 to 1.35.1 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/975 * Bump activesupport from 7.2.1.2 to 7.2.2 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/974 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>* Bump benchmark from 0.3.0 to 0.4.0 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/976">https://github.com/cloudfoundry/uaa-release/pull/976</a></li> <li>* Bump securerandom from 0.3.1 to 0.3.2 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/978">https://github.com/cloudfoundry/uaa-release/pull/978</a></li> <li>* Bump activesupport from 7.2.2 to 8.0.0 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/977">https://github.com/cloudfoundry/uaa-release/pull/977</a></li> <li>* Bump uri from 1.0.1 to 1.0.2 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/979">https://github.com/cloudfoundry/uaa-release/pull/979</a></li> <li>* Bump mini_portile2 from 2.8.7 to 2.8.8 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/980">https://github.com/cloudfoundry/uaa-release/pull/980</a></li> <li>* Bump github.com/cloudfoundry/bosh-utils from 0.0.500 to 0.0.502 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/981">https://github.com/cloudfoundry/uaa-release/pull/981</a></li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.18.0...v77.19.0">https://github.com/cloudfoundry/uaa-release/compare/v77.18.0...v77.19.0</a></li> </ul> |

#### ▼ v77.18.0

```

## What's Changed
### New UAA
* Bump to [UAA v77.18.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.18.0)
### Fixes
* [CVE-2024-38821] (https://spring.io/security/cve-2024-38821)
* [CVE-2024-21235] (https://nvd.nist.gov/vuln/detail/CVE-2024-21235)
### Dependency Bumps
* [Upgrade Bellsoft JDK to version 17.0.13+12] (https://github.com/cloudfoundry/uaa-release/commit/364cad45653130db03a5f2a87bd697722bcc8c) -> [CVE-2024-21235] (https://nvd.nist.gov/vuln/detail/CVE-2024-21235)
* [Upgrade Tomcat to version 9.0.96] (https://github.com/cloudfoundry/uaa-release/commit/1cd0037b07de2896008cfbddc4766815cb4eeee9)
* Bump github.com/cloudfoundry/bosh-utils from 0.0.499 to 0.0.500 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/969
* Bump activesupport from 7.2.1 to 7.2.1.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/970
* Bump rspec-core from 3.13.1 to 3.13.2 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/971
**Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.17.0...v77.18.0

```

| Component         | Version | Release Notes |
|-------------------|---------|---------------|
|                   |         | 8.0           |
| tanzu-jammy-stack | 1.0.1   |               |

## 6.0.1 - 6.0.10

See [TAS Patch Version v6.0.1-v6.0.10 Release Notes](#).

## New features in VMware Tanzu Application Service for VMs v6.0

These are the new features for VMware Tanzu Application Service for VMs v6.0.

### Updates to GenAI for Tanzu Application Service (beta)

- **Improved vSphere Support:** Platform engineers can now deploy large language models on larger GPUs, such as the Nvidia A100, on VMware vSphere-backed deployments. This allows for larger models to be deployed and for improved inferencing times
- **Azure Support:** GenAI for Tanzu Application Service, has been validated to work with Azure as a support IaaS destination in addition to AWS, GCP, and vSphere, providing customers with more choices across cloud providers
- **Multi-Model Support:** GenAI for Tanzu Application Service now supports multiple worker models running simultaneously, which expands the types of applications that can use this service. This enables platform engineers to deploy multiple types of LLMs optimized for different use cases. For instance, a platform engineer can deploy a model optimized for chatbots and models optimized for code completion
- **Improved inferencing speeds with vLLM support:** In addition to the [fastchat](#) deployment option, platform engineers can serve LLMs via [vLLM](#), optimized for inference throughput. This improves overall model response times and preparation for running models in production

### Improved Autoscaling based on Application CPU Usage

- **Managing CPU-based autoscaling** rules for their apps with less tuning and fewer errors: App Autoscaler has been updated to use CPU entitlement metrics, which greatly improves the overall autoscaling of applications based on CPU usage. App Autoscaler provides a new rule that monitors an app's average usage of its CPU entitlement and scales the app up or down accordingly.
  - Unlike with the previous CPU processor utilization rule, the scaling thresholds for this rule do not need to change when developers adjust the memory allocation for the app or when the platform engineers adjust the size of the underlying Diego cell container-host VMs. When configured through the improved autoscaling UI in Apps Manager, developers get sensible default values of 30% and 80% for the low and high scaling thresholds, which should be a good starting point for most apps. Developers should have an easier and more intuitive experience configuring this new autoscaling rule for their apps.

## Improved Platform Footprint and Enhanced Operations

- **Small footprint** now supports an in-place upgrade to a full Tanzu Application Service Installation: [Small footprint for Tanzu Application Service](#) now supports customers that want to upgrade to a “full” Tanzu Application Service installation. Small footprint Tanzu Application Service was generally considered to be used for proof of concept or sandbox environments, but this upgrade path will allow platform engineers to migrate to full installation without having to reinstall the platform. This should allow organizations to start with an overall smaller footprint (~4-6 virtual machines) at a lower cost and gives them the option to grow their platform footprint in their own time. The small footprint for Tanzu Application Service is also fully supported for production use and can be utilized in locations with limited infrastructure footprint, such as an edge location.
- **Availability Zone Aware routing for Gorouter:** The Gorouter has a new, opt-in feature to prefer local routing within an Availability Zone. When this option is enabled, the Gorouters will attempt to route all application traffic to application instances running on Diego cells within their local availability zone. This will improve the overall network traffic path and reduce overall round-trip latency to improve application performance. Gorouters will prefer not to send traffic to traffic to application instances running on other Availability Zones, but will in the event that no application instances are running in their zone.
- **Scale your dopplers and traffic controllers all the way to 0:** For Tanzu Application Service installations using aggregate syslog drains to send app logs and metrics via the syslog protocol, platform engineers can now completely turn off the doppler and traffic controller VMs at the core of the loggregator subsystem. This optimization represents another step forward in the transition towards the new, more efficient “shared-nothing” observability architecture that is incrementally replacing earlier generations of observability subsystems, and helps platform engineers further reduce their infrastructure costs. Note: To completely scale down to 0, platform engineers must stop the use of firehose nozzles and other tiles that utilize nozzles, such as Healthwatch and App Metrics.
- **Human-readable foundation names in the platform log stream:** Platform engineers can configure a human-readable foundation tag in their outgoing platform log stream. This will improve the overall experience when sending multiple foundation log streams to a log aggregation platform, as platform engineers will be able to identify what foundation is sending logs, ultimately avoiding mistakes and eliminating the need to re-work.
- **Certificate Rotation Dashboard for internal certificate management:** Tanzu Operations Manager has been updated to include a Certificate Rotation Dashboard to continuously improve the internal platform certification rotation and management process. The dashboard allows platform engineers to track certification rotation status to easily understand the next step for the certificate rotation process within their Tanzu Application Service environments.
- **Configurable App File descriptor limits:** Tanzu Application Service allows platform engineers to change the default Linux file descriptor limits for applications running on the platform. This feature enables applications to move to the platform that requires larger than normal numbers of Unix file descriptors. This allows for more application types to be migrated onto the Tanzu Application Service platform.

## Enhancements to Enable Improved Platform Security Postures

- **Early access to FIPS-compliant stemcells:** Tanzu Application Service now supports the use of **FIPS-compliant** Jammy stemcells through early access to federal customers for their TAS foundations. Please reach out to the Tanzu team if interested in testing out this feature.
- **Manage local User Account and Authentication (UAA) Password policies when external identity providers are configured:** Local UAA password policies can be set and maintained in conjunction with an external identity provider. This change enables better security posture for platform engineers who are managing local platform accounts.

## Tanzu Application Service Ecosystem Optimizations

Enhancements to the AWS Cloud Service Broker

- **Support for the AWS Simple Queue Service (SQS):** Platform engineers can now add production-ready plans for the AWS SQS service to their Tanzu Application Service marketplace offerings. Developers can easily deploy and use the AWS SQS service to expand upon their application use cases just like any other service supported by the Cloud Service Broker.
- **Support for AWS GovCloud Regions:** The Cloud Service Broker for AWS is now supported for use in AWS GovCloud Regions. Customers who wish to use these regions can now begin to migrate off the legacy AWS service broker and take advantage of all the new features and functionality of the Cloud Service Broker, allowing them with more options across cloud providers.

## Reduced logging and metric infrastructure requirements

If you do not use the legacy V1 and V2 Loggregator Firehoses, you now can scale Doppler and Traffic Controller VMs down to zero. This can significantly reduce costs or free up resources for running additional workloads on the platform. You might not be able to scale down to zero if you use integrations or other features that depend on the Firehose, such as log and metric nozzles or Metric Registrar.

### Reintroduction of global log rate limit

TAS for VMs v3.0 introduced granular app log rate limits for fine-grained control over application log rates.

TAS for VMs v4.0 removed the older global log rate limit feature **App log rate limit (deprecated)** under **App Containers**. This was problematic for operators who were performing a jump upgrade to TAS for VMs v4.0 (skipping v3.0), as logs would not be rate limited until application-based log rate limits were applied.

TAS for VMs v6.0 restores the global log rate limit, so that operators can perform upgrades while retaining log rate limits. Operators must configure the same setting separately for both Isolation Segment and TAS for VMs [Windows].

If you had previously set a global log rate limit, this limit is re-applied following the upgrade to VMware Tanzu Application Service for VMs v6.0.

### App Autoscaler supports scaling on CPU entitlement

VMware Tanzu Application Service for VMs v6.0 introduces support for autoscaling on CPU entitlement. This improves App Autoscaler support for scaling on CPU. Previously, App Autoscaler CPU rules could be brittle due to their dependency on the underlying Diego Cell configuration. With this feature, apps can autoscale on the CPU entitlement available, calculated appropriately based on the memory allocated.

## Breaking Changes

For breaking changes when upgrading VMware Tanzu Application Service for VMs to v6.0, see [Breaking Changes](#).

## Known issues

Here are the known issues for VMware Tanzu Application Service for VMs v6.0.

### cf-networking-release versions 3.67.0 - 3.70.0 bug can break pagination

cf-networking-release versions 3.67.0 - 3.70.0 contain a bug that breaks pagination for listing and removing container-to-container (c2c) network policies when the user has more than 100 roles, as is often the case for users involved in automated provisioning. This bug only affects listing and removing network policies and not enforcing those policies. This bug also does not affect Application Security Groups. For more information, see this [Knowledge Base article](#).

**Affected versions:** 6.0.14, 6.0.15, 6.0.16

### Loggregator Agents in other products may log failure when Dopplers are scaled to zero

Service tile products can use Loggregator Agent to egress metrics for service instances. If the Doppler instance group is scaled to zero, then Loggregator Agent jobs deployed by these products may repeatedly log a failure to connect to Doppler:

```
failed to connect: unable to lookup a log consumer
```

### UAA causes database overload (for VMware Tanzu Application Service for VMs 6.0.0 and 6.0.1)

The UAA can cause and experience slowness in its database when attempting to hit its [/Users](#) endpoint. The issue is especially noticeable when the UAA contains a large number of users; for example, in the millions. This only happens when using a MySQL database. VMware Tanzu Application Service for VMs 6.0.2 fixes the issue.

## TAS Patch Version v6.0.1-v6.0.10 Release Notes

These are the release notes for VMware Tanzu Application Service for VMs (TAS for VMs) v6.0 patch releases v6.0.1 to v6.0.10.

See [VMware Tanzu Application Service for VMs v6.0 Release Notes](#) for current patch release notes.

## Releases

### 6.0.10

**Release Date:** 11/19/2024

**[Bug Fix]** Fix memory leak in route registrar. **[Bug Fix]** Resolves an issue where NFS-volume mounts occasionally failed on Diego Cells due to excessive rpcbind/stad process restarts. **[Bug Fix]** Resolves an issue where tcp\_router would erroneously be updated during deploys. **[Bug Fix]** Gorouter now properly calculates header sizes when limiting “Maximum request header size” on HTTP requests.

- Bump backup-and-restore-sdk to version 1.19.35
- Bump capi to version 1.194.0
- Bump cf-autoscaling to version 250.3.5
- Bump cf-networking to version 3.52.0
- Bump cflinuxfs3 to version 0.417.0
- Bump credhub to version 2.12.93
- Bump loggregator-agent to version 8.3.0
- Bump nfs-volume to version 7.8.0
- Bump routing to version 0.319.0
- Bump silk to version 3.52.0
- Bump smb-volume to version 3.9.0
- Bump uaa to version 77.17.0

| Component                | Version | Release Notes                                                                                                                               |
|--------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------|
| ubuntu-jammy stemcell    | 1.639   |                                                                                                                                             |
| backup-and-restore-sdk   | 1.19.35 | <p>▼ v1.19.35</p> <pre>## Changes * Add `ci/configure.sh` script and remove unused `values.yml` * Add final release 1.19.34 [ci skip]</pre> |
| binary-offline-buildpack | 1.1.13  |                                                                                                                                             |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                             |
| bpm                      | 1.4.0   |                                                                                                                                             |
| capi                     | 1.194.0 |                                                                                                                                             |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-autoscaling   | 250.3.5        | <p>▼ v250.3.5</p> <pre>## What's Changed * Add debug log for detected RabbitMQ URL encoding failure</pre> <p>▼ v250.3.4</p> <pre>## What's Changed * Bump dependencies * Avoid a panic from special characters in RabbitMQ service instance passwords</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| cf-cli           | 1.67.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| cf-networking    | 3.52.0         | <p>▼ v3.52.0</p> <pre>## 3.52.0 **Release Date**: October 03, 2024 ## Changes - [Bump the example-apps to Golang 1.23 ()](https://github.com/cloudfoundry/cf-networking-release/commit/0a4815b48b911c4ef3201bb1faa9c097c99f3e74) https://github.com/cloudfoundry/cf-networking-release/pull/303[] (https://github.com/cloudfoundry/cf-networking-release/commit/0a4815b48b911c4ef3201bb1faa9c097c99f3e74) - [Upgrade cf-networking-healthchecker] (https://github.com/cloudfoundry/cf-networking-release/commit/6b0bf9b821719b2097608117e1760f3a3e4cda93) ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/cf-networking-release/compare/v3.51.0...v3.52.0 ## Resources - [Download release 3.52.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.52.0).</pre> |
| cflinuxfs3       | 0.417.0        | <p>▼ v0.417.0</p> <pre>This release ships with cflinuxfs3 version 0.417.0. For more information, see the [release notes] (https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.417.0)</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| cflinuxfs4       | 1.130.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| <b>Component</b>                | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| count-cores-indicator           | 2.0.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| credhub                         | 2.12.93        | <p>▼ 2.12.93</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.92...2.12.93">https://github.com/pivotal/credhub-release/compare/2.12.92...2.12.93</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| diego                           | 2.105.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| dotnet-core-offline-buildpack   | 2.4.33         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| garden-runc                     | 1.57.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| go-offline-buildpack            | 1.10.23        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| java-offline-buildpack          | 4.73.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| java-native-image-cnb-buildpack | 0.11.22        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| log-cache                       | 3.1.5          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| loggregator                     | 107.0.17       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| loggregator-agent               | 8.3.0          | <p>▼ v8.3.0</p> <pre>## What's Changed * Add `https-batch` protocol to loggr-syslog-agent for more efficient (batched) https drains by @nicklas-dohrn in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/491">https://github.com/cloudfoundry/loggregator-agent-release/pull/491</a> * Bump dependencies * Bump packaged Golang to go1.22.8 ## New Contributors * @nicklas-dohrn made their first contribution in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/491">https://github.com/cloudfoundry/loggregator-agent-release/pull/491</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.1...v8.3.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.1...v8.3.0</a></pre> |
| mapfs                           | 1.4.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| metric-registrar                | 4.0.3          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| mysql-monitoring                | 10.16.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| nats                            | 56.25.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.8.0   | <p>▼ v7.8.0</p> <pre> ## 7.8.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.7.0...v7.8.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.7.0...v7.8.0</a> ## Resources - [Download release 7.8.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.8.0). </pre>                                                                                                                                                                                                                               |
|            |         | <p>▼ v7.7.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|            |         | <pre> ## 7.7.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. - Ensure uid/guids are parsed for uint32 compatibility before downcasting - <a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1043">https://github.com/cloudfoundry/nfs-volume-release/pull/1043</a> - Thanks @geofffranks ! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.6.0...v7.7.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.6.0...v7.7.0</a> ## Resources - [Download release 7.7.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.7.0). </pre> |
|            |         | <p>▼ v7.6.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|            |         | <pre> ## 7.6.0 **Release Date**: October 31, 2024 ## Changes - Fix bbr metadata.sh.erb - <a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1042">https://github.com/cloudfoundry/nfs-volume-release/pull/1042</a> - Thanks @jochenehret! - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.5.0...v7.6.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.5.0...v7.6.0</a> ## Resources - [Download release 7.6.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.6.0). </pre>                                                   |
|            |         | <p>▼ v7.5.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| <b>Component</b>           | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                | <pre> ## 7.5.0 **Release Date**: October 18, 2024 ## Changes - Bump to golang 1.23.2 - Now requires 3 consecutive failures to connect to rpcbind + statd ports before monit restarting the services, to avoid problems with ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.4.0...v7.5.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.4.0...v7.5.0</a> ## Resources - [Download release 7.5.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.5.0). </pre> |
| nginx-offline-buildpack    | 1.2.19         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| nodejs-offline-buildpack   | 1.8.29         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| notifications              | 73.0.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| notifications-ui           | 50.0.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| otel-collector             | 0.10.1         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| php-offline-buildpack      | 4.6.24         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| push-apps-manager-release  | 677.0.60       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| push-offline-docs-release  | 6.0.169        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| push-usage-service-release | 674.0.123      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| pxc                        | 1.0.31         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| python-offline-buildpack   | 1.8.29         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| r-offline-buildpack        | 1.2.15         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.319.0 | <p>▼ v0.319.0</p> <pre>## 0.319.0 **Release Date**: November 14, 2024 ## Changes - Bumps haproxy to 2.8.12 ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.318.0...v0.319.0">https://github.com/cloudfoundry/routing-release/compare/v0.318.0...v0.319.0</a> ## Resources - [Download release 0.319.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.319.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.319.0</a>).</pre> <p>▼ v0.318.0</p> <pre>## 0.318.0 **Release Date**: November 05, 2024 ## Changes - Enhance Gorouter retry logic - <a href="https://github.com/cloudfoundry/gorouter/issues/437">https://github.com/cloudfoundry/gorouter/issues/437</a> - Thanks @b1tamara! - Update Routing-API and route registrar for tcp routes - <a href="https://github.com/cloudfoundry/routing-release/commit/80cab2aafbbbe30c9fd1458d9ac5452fe0457f1">https://github.com/cloudfoundry/routing-release/commit/80cab2aafbbbe30c9fd1458d9ac5452fe0457f1</a> - Thanks @geofffranks! - Convert all port handling logic to uint16 - Thanks @geofffranks ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index 4f887265..b9afabbe 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -71,16 +71,13 @@ properties:    description: "Log level for route_registrar"    default: "info"    route_registrar.routing_api.api_url:      - description: (optional, string) The routing API's URL. This is required to register any TCP routes.        default: https://routing-api.service.cf.internal:3001      + description: (optional, string) The routing API's URL. This is required to register any TCP routes. If not provided here or via link, this defaults to 'https://routing-api.service.cf.internal:3001'    route_registrar.routing_api.oauth_url:      - description: (optional, string) The OAuth server's URL. This is required to register any TCP routes.        default: https://uaa.service.cf.intern</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> al:8443 +   description: (optional, string) The OAuth server's URL. This is required to register any TCP routes. If not provided here or via link, this defaults to 'https://uaa.service.cf.internal:8443' route_registrar.routing_api.client_id: -   description: (optional, string) An OAuth client ID for a client that is permitted to add new TCP routes. This is required to register any TCP routes. -   default: routing_api_client +   description: (optional, string) An OAuth client ID for a client that is permitted to add new TCP routes. This is required to register any TCP routes. If set, overrides values provided via routing_api's link. If not provided via link or property, defaults to 'routing_api_client'. route_registrar.routing_api.client_secret: -   description: (optional, string) The OAuth client secret for the above client. This is required to register any TCP routes. +   description: (optional, string) The OAuth client secret for the above client. This is required to register any TCP routes. If set, overrides values provided via routing_api's link. If not provided via link, this must be set when registering TCP routes. route_registrar.routing_api.ca_certs: description: (optional, array of strings) The certificate authority certificates for any APIs that the route registrar is communicating with over HTTPS, e.g., the OAuth server. This is required to register any TCP routes. route_registrar.routing_api.skip_ssl_validation: diff --git a/jobs/routing-api/spec b/jobs/routing-api/spec index 2e5cd361..bea7e6ca 100644 --- a/jobs/routing-api/spec +++ b/jobs/routing-api/spec @@ -47,6 +47,8 @@ provides: - routing_api.reserved_system_component_ports - routing_api.enabled_api_endpoints - routing_api.max_ttl + - uaa.token_endpoint + - uaa.tls_port - uaa.ca_cert - skip_ssl_validation - name: routing_api_db ``` ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.317.0...v0.318.0">https://github.com/cloudfoundry/routing-release/compare/v0.317.0...v0.318.0</a> </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>## Resources - [Download release 0.318.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.318.0).</pre> <p>▼ v0.317.0</p> <pre>## 0.317.0 **Release Date**: October 21, 2024 ## Changes - Fixes a bug where gorouter was incorrectly calculating HTTP request header lengths when evaluating the `router.max_header_kb` property - Fixes a bug with tcp_router where BOSH was incorrectly determining that the tcp_router job had templates needing to be updated, when not using backend TLS certificates. ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.316.0...v0.317.0">https://github.com/cloudfoundry/routing-release/compare/v0.316.0...v0.317.0</a> ## Resources - [Download release 0.317.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.317.0).</pre> |
|           |         | <p>▼ v0.316.0</p> <pre>## 0.316.0 **Release Date**: October 17, 2024 ## Changes - Bug fix: Map reserved_system_component_ports to integer - <a href="https://github.com/cloudfoundry/routing-release/pull/438">https://github.com/cloudfoundry/routing-release/pull/438</a> ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.315.0...v0.316.0">https://github.com/cloudfoundry/routing-release/compare/v0.315.0...v0.316.0</a> ## Resources - [Download release 0.316.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.316.0).</pre>                                                                                                                                                                                                                                                                              |
|           |         | <p>▼ v0.315.0</p> <pre>## 0.315.0 **Release Date**: October 17, 2024 ## Changes - Bug fix: Fix memory leak from calling ifrit.Wait. Fixes <a href="https://github.com/cloudfoundry/route-registrar/issues/59">https://github.com/cloudfoundry/route-registrar/issues/59</a>. Thank you @bltamara , @charleshansen , and @maxmoehl ! ## Built with go 1.23.2</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component | Version           | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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|           |                   | <pre>**Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.314.0...v0.315.0">https://github.com/cloudfoundry/routing-release/compare/v0.314.0...v0.315.0</a> ## Resources - [Download release 0.315.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.315.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.315.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|           | <b>▼ v0.314.0</b> | <pre>## 0.314.0 **Release Date**: October 03, 2024 ## △ △ △ △ △ **KNOWN ISSUE** △ △ △ △ △ **CAUTION:** This release is affected by a memory leak in the route registrar job. Users can monitor their VMs' memory usage and monit restart the route_registrar process as necessary.  ## Changes - Bump to Go 1.23.2 ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.313.0...v0.314.0">https://github.com/cloudfoundry/routing-release/compare/v0.313.0...v0.314.0</a> ## Resources - [Download release 0.314.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.314.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.314.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                     |
|           | <b>▼ v0.313.0</b> | <pre>## 0.313.0 **Release Date**: October 02, 2024 ## △ △ △ △ △ **KNOWN ISSUE** △ △ △ △ △ **CAUTION:** This release is affected by a memory leak in the route registrar job. Users can monitor their VMs' memory usage and monit restart the route_registrar process as necessary.  ## Changes * Upgrade zap to 1.x, remove zap 0.x in <a href="https://github.com/cloudfoundry/routing-release/pull/434">https://github.com/cloudfoundry/routing-release/pull/434</a>. Thank you @hoffmaen! ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0">https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0</a> ## Resources - [Download release 0.313.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.313.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.313.0</a>). **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0">https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0</a></pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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|           |         | <p>▼ v0.312.0</p> <pre> ## 0.312.0 **Release Date**: September 30, 2024 ## Δ Δ Δ Δ Δ **KNOWN ISSUE** Δ Δ Δ Δ Δ **CAUTION:** This release is affected by a memory leak in the route registrar job. Users can monitor their VMs' memory usage and monit restart the route_registrar process as necess ary.  ## Changes - Upgrade to Go 1.23 - [Make ReadHeaderTimeout configurable in r elease] (<a href="https://github.com/cloudfoundry/routi ng-release/commit/b4013be629c709437b871f60bc5 b3793f6a8d348">https://github.com/cloudfoundry/routi ng-release/commit/b4013be629c709437b871f60bc5 b3793f6a8d348</a>)   - [fix: bump minimum go version to 1.23 for partitioned cookies ()] (<a href="https://github.com/clo udfoundry/routing-release/commit/f8b9f683418a 8c458db2eb139d1bfd045986c11e">https://github.com/clo udfoundry/routing-release/commit/f8b9f683418a 8c458db2eb139d1bfd045986c11e</a>) <a href="https://github.c om/cloudfoundry/routing-release/pull/437[]">https://github.c om/cloudfoundry/routing-release/pull/437[]</a> (<a href="https://github.com/cloudfoundry/routing-releas e/commit/f8b9f683418a8c458db2eb139d1bfd045986 c11e">https://github.com/cloudfoundry/routing-releas e/commit/f8b9f683418a8c458db2eb139d1bfd045986 c11e</a>)   - Various Minor Bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/acceptance_tests/spec b/j obs/acceptance_tests/spec index 8122ddaf..51a81762 100644 --- a/jobs/acceptance_tests/spec +++ b/jobs/acceptance_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.22-linux + - golang-1.23-linux - acceptance_tests - rtr - cf-cli-8-linux diff --git a/jobs/gorouter/spec b/jobs/goro uter/spec index 60c7b520..c7896a27 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -364,6 +364,9 @@ properties: Generally, this timeout must be greater tha n that of the load balancer. As examples, GCP HTTP(S) load balancer has a default timeout o f 600 seconds so a value greater than 600 is recommended and AWS ELB has a default timeout of 60 seconds so a value greater than 60 is r ecommended.  However, depending on the IaaS, this timeou t may need to be shorter than the load balanc er's timeout, e.g., Azure's load balancer tim es out at 240 seconds (by default) and GCP TC </pre> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |         | <p>P load balancer times out at 600 seconds without sending a TCP RST to clients, so a value lower than this is recommended in order to force it to send the TCP RST.</p> <pre> default: 900 +   router.read_header_timeout: +     description: "The amount of time allowed to read request headers." +     default: 0 router.backends.max_conns:   description: "Maximum concurrent TCP connections per backend. When set to 0 there is no limit"   default: 500 diff --git a/jobs/smoke_tests/spec b/jobs/smoke_tests/spec index 02edfd9d..4ea8eb07 100644 --- a/jobs/smoke_tests/spec +++ b/jobs/smoke_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: -- golang-1.22-linux + - golang-1.23-linux - acceptance_tests - cf-cli-8-linux ``` ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.311.0...v0.312.0">https://github.com/cloudfoundry/routing-release/compare/v0.311.0...v0.312.0</a> ## Resources - [Download release 0.312.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.312.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.312.0</a>).</pre> |
| ruby-offline-buildpack    | 1.10.18 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| web-servers-cnb-buildpack | 0.15.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.52.0  | <p>▼ v3.52.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## 3.52.0 **Release Date**: October 03, 2024 ## Changes - [Upgrade silk-healthchecker] (<a href="https://github.com/cloudfoundry/silk-release/commit/727573775dcdbc122423fa1789a3ccf26893125be">https://github.com/cloudfoundry/silk-release/commit/727573775dcdbc122423fa1789a3ccf26893125be</a>) - Various dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.51.0...v3.52.0">https://github.com/cloudfoundry/silk-release/compare/v3.51.0...v3.52.0</a> ## Resources - [Download release 3.52.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.52.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.52.0</a>).</pre></div> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume | 3.9.0   | <p>▼ v3.9.0</p> <pre>## 3.9.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.8.0...v3.9.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.8.0...v3.9.0</a> ## Resources - [Download release 3.9.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.9.0).</pre>                                                                                                                                                                                      |
|            |         | <p>▼ v3.8.0</p> <pre>## 3.8.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. - Fix bbr metadata - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/441">https://github.com/cloudfoundry/smb-volume-release/pull/441</a> - Thanks @jochenehret ! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.7.0...v3.8.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.7.0...v3.8.0</a> ## Resources - [Download release 3.8.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.8.0).</pre> |
|            |         | <p>▼ v3.7.0</p> <pre>## 3.7.0 **Release Date**: October 31, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.6.0...v3.7.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.6.0...v3.7.0</a> ## Resources - [Download release 3.7.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.7.0).</pre>                                                                                                                                                                                     |
|            |         | <p>▼ v3.6.0</p> <pre>## 3.6.0 **Release Date**: October 24, 2024 ## Changes</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |         | <ul style="list-style-type: none"> <li>- Update BBR lock/unlock dependencies - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/438">https://github.com/cloudfoundry/smb-volume-release/pull/438</a> - Thanks @davewalter!</li> <li>- Update for staticcheck compliant error message - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/440">https://github.com/cloudfoundry/smb-volume-release/pull/440</a> - Thanks @geofffranks!</li> <li>- Convert ioutilshim to osshim - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/439">https://github.com/cloudfoundry/smb-volume-release/pull/439</a> - Thanks @geofffranks!</li> <li>## Built with go 1.23.2</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.5.0...v3.6.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.5.0...v3.6.0</a></li> <li>## Resources</li> <li>- [Download release 3.6.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.6.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.6.0</a>) .</li> </ul> |
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| staticfile-offline-buildpack | 1.6.17  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| statsd-injector              | 1.11.43 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| syslog                       | 12.3.3  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| system-metrics-scraper       | 4.0.11  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa               | 77.17.0 | <p>▼ v77.17.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.17.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.17.0) ### Feature * add configuration option with default value for keepalive timeout to server.xml by @tack-sap in https://github.com/cloudfoundry/uaa-release/pull/964 ### Dependency Bumps * dependabot: no longer operates on 74.5.x branch by @peterhaochen47 in https://github.com/cloudfoundry/uaa-release/pull/963 * Bump github.com/cloudfoundry/bosh-utils from 0.0.496 to 0.0.498 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/966 * Bump rspec-mocks from 3.13.1 to 3.13.2 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/967 * Bump github.com/cloudfoundry/bosh-utils from 0.0.498 to 0.0.499 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/968 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.16.0...v77.17.0 </pre> |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## 6.0.9

**Release Date:** 10/07/2024



### Caution

This release is affected by a memory leak in the route registrar job, which is present on multiple VMs. To mitigate this issue see the following [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- Bump backup-and-restore-sdk to version [1.19.34](#)
- Bump bpm to version [1.4.0](#)
- Bump cf-networking to version [3.51.0](#)
- Bump cflinuxfs3 to version [0.416.0](#)
- Bump cflinuxfs4 to version [1.130.0](#)

- Bump credhub to version 2.12.92
- Bump diego to version 2.105.0
- Bump garden-runc to version 1.57.0
- Bump go-offline-buildpack to version 1.10.23
- Bump mapfs to version 1.4.0
- Bump nats to version 56.25.0
- Bump nfs-volume to version 7.4.0
- Bump notifications-ui to version 50.0.0
- Bump php-offline-buildpack to version 4.6.24
- Bump push-apps-manager-release to version 677.0.60
- Bump r-offline-buildpack to version 1.2.15
- Bump silk to version 3.51.0
- Bump smb-volume to version 3.5.0
- Bump staticfile-offline-buildpack to version 1.6.17

| Component                | Version | Release Notes                                                                 |
|--------------------------|---------|-------------------------------------------------------------------------------|
| ubuntu-jammy stemcell    | 1.572   |                                                                               |
| backup-and-restore-sdk   | 1.19.34 | <p>▼ v1.19.34</p> <pre>## Changes * Add final release 1.19.33 [ci skip]</pre> |
| binary-offline-buildpack | 1.1.13  |                                                                               |
| bosh-dns-aliases         | 0.0.4   |                                                                               |
| bpm                      | 1.4.0   |                                                                               |
| capi                     | 1.193.0 |                                                                               |
| cf-autoscaling           | 250.3.2 |                                                                               |
| cf-cli                   | 1.67.0  |                                                                               |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.51.0  | <p>▼ v3.51.0</p> <pre> ## 3.51.0 **Release Date**: September 24, 2024 ## Changes - Bump to Go 1.23 - [Add ReadHeaderTimeout option on the server] (https://github.com/cloudfoundry/cf-networking-release/commit/a32d19d7120dfec4037121232b84c238f3eaa2f3) - [Pass ReadHeaderTimeout to lagerlevel Server] (https://github.com/cloudfoundry/cf-networking-release/commit/b1fc8c3ad3abfd94fbcaf9b2c4c32987c556222) - [Fix file/dir creation permissions] (https://github.com/cloudfoundry/cf-networking-release/commit/2a095f5b94a449585a3082e60cd0d1466d1611ed) - [Catch or explicitly ignore unhandled errors] (https://github.com/cloudfoundry/cf-networking-release/commit/a4d4085dfeb78c3ee06bad109ba073f6a853d80f)  ## Bosh Job Spec changes: ```diff diff --git a/jobs/performance-test-sd/spec b/jobs/performance-test-sd/spec index 0583340e..fd83a044 100644 --- a/jobs/performance-test-sd/spec +++ b/jobs/performance-test-sd/spec @@ -6,7 +6,7 @@ templates:  config.json.erb: config.json  packages:  - - golang-1.22-linux + - golang-1.23-linux - performance-test-sd  consumes:  diff --git a/jobs/service-discovery-controller/spec b/jobs/service-discovery-controller/spec index 6786aad9..46deb276 100644 --- a/jobs/service-discovery-controller/spec +++ b/jobs/service-discovery-controller/spec @@ -51,6 +51,10 @@ properties:  description: "Interval in seconds for which the route emitter is told to emit all routes. This value should be less than the staleness_threshold_seconds"  default: 60 + read_header_timeout: +   description: "The amount of time allowed to read request headers" +   default: 30s +  dnshttps.server.tls:  description: "Server-side mutual TLS config" ``` </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>uration for dns over http" dnshttps.client.ca: ```  ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.50.0...v3.51.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.50.0...v3.51.0</a>  ## Resources - [Download release 3.51.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.51.0).</pre> |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs3       | 0.416.0        | <p>▼ v0.416.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.416.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.416.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.416.0</a>)</p> </div> <p>▼ v0.415.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.415.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.415.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.415.0</a>)</p> </div> <p>▼ v0.414.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.414.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.414.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.414.0</a>)</p> </div> <p>▼ v0.413.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.413.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.413.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.413.0</a>)</p> </div> <p>▼ v0.412.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.412.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.412.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.412.0</a>)</p> </div> <p>▼ v0.411.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.411.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.411.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.411.0</a>)</p> </div> <p>▼ v0.410.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.410.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.410.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.410.0</a>)</p> </div> |

| Component | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | v0.409.0 | <p>▼ v0.409.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.409.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.409.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.409.0</a>)</p></div> <p>▼ v0.408.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.408.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.408.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.408.0</a>)</p></div> |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4       | 1.130.0        | <p>▼ v1.130.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.130.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.130.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.130.0</a>)</p> </div> <p>▼ v1.129.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.129.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.129.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.129.0</a>)</p> </div> <p>▼ v1.128.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.128.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.128.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.128.0</a>)</p> </div> <p>▼ v1.127.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.127.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.127.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.127.0</a>)</p> </div> <p>▼ v1.126.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.126.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.126.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.126.0</a>)</p> </div> <p>▼ v1.125.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.125.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.125.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.125.0</a>)</p> </div> <p>▼ v1.124.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.124.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.124.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.124.0</a>)</p> </div> |

| Component | Version  | Release Notes                                                                                                                                                                                                                                            |
|-----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | v1.122.0 | <p>This release ships with cflinuxfs4 version 1.122.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.122.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.122.0</a>)</p> |
|           | v1.121.0 | <p>This release ships with cflinuxfs4 version 1.121.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.121.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.121.0</a>)</p> |
|           | v1.120.0 | <p>This release ships with cflinuxfs4 version 1.120.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.120.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.120.0</a>)</p> |
|           | v1.119.0 | <p>This release ships with cflinuxfs4 version 1.119.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.119.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.119.0</a>)</p> |
|           | v1.118.0 | <p>This release ships with cflinuxfs4 version 1.118.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.118.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.118.0</a>)</p> |
|           | v1.117.0 | <p>This release ships with cflinuxfs4 version 1.117.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.117.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.117.0</a>)</p> |
|           | v1.115.0 | <p>This release ships with cflinuxfs4 version 1.115.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.115.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.115.0</a>)</p> |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                | <p>▼ v1.114.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.114.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.114.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.114.0</a>)</p> </div> <p>▼ v1.113.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.113.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.113.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.113.0</a>)</p> </div> <p>▼ v1.108.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.108.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.108.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.108.0</a>)</p> </div> |
| count-cores-indicator | 2.0.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| credhub               | 2.12.92        | <p>▼ 2.12.92</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Enable TLS 1.3 * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.91...2.12.92">https://github.com/pivotal/credhub-release/compare/2.12.91...2.12.92</a></pre> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.105.0 | <p>▼ v2.105.0</p> <pre> ## 2.105.0 **Release Date**: October 01, 2024 ## Changes - Upgrade to Go 1.23! - [add healthcheck metrics property] (https://github.com/cloudfoundry/diego-release/commit/fe3aae75d48e6340b526e1d5d327732cd7bf1a8c) - [add healthcheck property to rep_windows config template] (https://github.com/cloudfoundry/diego-release/commit/7dce01426b119d53d0b8923e2681884bb5a4cab7) - [add missing default params for linters] (https://github.com/cloudfoundry/diego-release/commit/e9ccee2dd2bf78c83b15d27c711669c67261d103) - [add metadata to docs and reorder them] (https://github.com/cloudfoundry/diego-release/commit/af178fa335254d47a8fd507822003c60bad4ba59) - Various dependency bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/rep/spec b/jobs/rep/spec index 405f90f46..0737d9d1a 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -235,7 +235,9 @@ properties: enable_declarative_healthcheck: description: "When set, enables the rep to prefer the LRP CheckDefinition to healthcheck instances over the Monitor action. Requires G arden-Runc v1.10.0+" default: false - + enable_healthcheck_metrics: +   description: "When set, enables the rep to emit healthcheck failure metrics. Requires enable_declarative_healthcheck to be set to true." +   default: false cell Registrations.locket.enabled: description: Enable the cell rep to register itself as a service with Locket. default: true diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 0521d1061..4a7dfefc6 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -237,13 +237,16 @@ properties: diego.rep.locket.client_keepalive_timeout: description: "Timeout in seconds to receive a response to the keepalive ping. If a response is not received within this time, the lock et client will reconnect to another server." </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> default: 22 - + enable_declarative_healthcheck: description: "When set, enables the rep to prefer the LRP CheckDefinition to healthcheck instances over the Monitor action." default: false declarative_healthcheck_path: description: "The directory containing the declarative healthcheck binary" default: "/var/vcap/packages/healthcheck_windows/external" + enable_healthcheck_metrics: + description: "When set, enables the rep to emit healthcheck failure metrics. Requires enable_declarative_healthcheck to be set to true." + default: false cell_registrations.locket.enabled: description: Enable the cell rep to register itself as a service with Locket. diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index d61278357..901e5236d 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ --- name: vizzini packages: - - golang-1.22-linux + - golang-1.23-linux - vizzini templates: ``` ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.104.0...v2.105.0">https://github.com/cloudfoundry/diego-release/compare/v2.104.0...v2.105.0</a> ## Resources - [Download release 2.105.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.105.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.105.0</a>).</pre> <p>▼ v2.104.0</p> <pre> ## 2.104.0 **Release Date**: September 24, 2024 ## Changes - Bumped to Envoy to 1.28.7 - [Update file permissions for BBS access log] (<a href="https://github.com/cloudfoundry/bbs/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718">https://github.com/cloudfoundry/bbs/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718</a>) - [Update file permissions for Buildpack App Lifecycle access log] (<a href="https://github.com/cloudfoundry/app-lifecycle/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718">https://github.com/cloudfoundry/app-lifecycle/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718</a>) </pre> |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |         | <pre> oudfoundry/bbs/compare/9be69c0199dbd4818203b7 382454616d56463e69...4b574f98c713f8e77467ec6a 4ac953ab52ddc718)   - [Update file permissions for cacheddownlo ader] (<a href="https://github.com/cloudfoundry/cachedd ownloader/compare/09b8631e33d0adb38bbae81529b 63fa3f92d0925...a52cc2a85daa3e138cead7c748881 d24af914c4a">https://github.com/cloudfoundry/cachedd ownloader/compare/09b8631e33d0adb38bbae81529b 63fa3f92d0925...a52cc2a85daa3e138cead7c748881 d24af914c4a</a>)   - [Update file permissions for Executor] (<ht ##="" (<http="" **full="" -="" 0a01dbec448f78e493c86b0d2672a646f43e9a53...="" 1.22.7="" 180="" 74ea13ef2ca3a6195fed63ce639b2e677ee39...3d1da="" <a="" [update="" a8f0e01a67921c94cfabfc933bb436f1c101faae)="" built="" bumps="" changelog**:="" cloudfoundry="" compar="" compare="" dependency="" e="" executor="" ff34a1d91f50f1615cc6089658f953c7d59)="" file="" for="" github.com="" go="" href="https://github.com/clou dfoundry/diego-release/compare/v2.103.0...v2. 104.0" inigo="" inigo]="" permissions="" s:="" tps:="" various="" with="">https://github.com/cloudfoundry/diego-release/compare/v2.103.0...v2. 104.0   ## Resources   - [Download release 2.104.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.104.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.104.0</a>). </ht></pre> |
| dotnet-core-offline-buildpack | 2.4.33  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| garden-runc                   | 1.57.0  | <p>▼ v1.57.0</p> <pre> ## 1.57.0 **Release Date**: October 02, 2024 ## Changes - Upgrade to Go 1.23 - [Create a top-level dir for libtool] (<a href="https://github.com/cloudfoundry/garden-runc-releas e/commit/fb83c7757f43ec7d4f39b7a9d5fbacbdbd2 24b11">https://github.com/cloudfoundry/garden-runc-releas e/commit/fb83c7757f43ec7d4f39b7a9d5fbacbdbd2 24b11</a>)   ## Built with go 1.23.2   **Full Changelog**: <a href="https://github.com/clou dfoundry/garden-runc-release/compare/v1.56. 0...v1.57.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.56. 0...v1.57.0</a>   ## Resources   - [Download release 1.57.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundr y/garden-runc-release?version=1.57.0">https://bosh.io/releases/github.com/cloudfoundr y/garden-runc-release?version=1.57.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Component                       | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| go-offline-buildpack            | 1.10.23  | <p>▼ 1.10.23</p> <pre> * Add go 1.22.7, remove go 1.22.6 for stack(s) cflinuxfs3, cflinuxfs4 * Add go 1.23.1, remove go 1.23.0 for stack(s) cflinuxfs3, cflinuxfs4 * remove godep setup-gopath test * Fix brats: these tests are removed upstream am   name   version   cf_stacks     -   -     dep   0.5.4   cflinuxfs3     dep   0.5.4   cflinuxfs4     glide   0.13.3   cflinuxfs3     glide   0.13.3   cflinuxfs4     go   1.22.7   cflinuxfs3     go   1.22.7   cflinuxfs4     go   1.23.1   cflinuxfs3     go   1.23.1   cflinuxfs4     godep   80   cflinuxfs3     godep   80   cflinuxfs4   Default binary versions:   name   version     -   -   go   1.22.x   * Uncached buildpack SHA256: 4fc40cf32943b1 1f825a1aa81ea1c8bb7de0e608d8c1eaa94eec339fd6b a5db4 * Uncached buildpack SHA256: 6a2a723c0e2dd6 4c85b6b227d7a41d3cf435134bb5a5e84c7ceb5759a45 b7beb </pre> |
| java-offline-buildpack          | 4.73.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| java-native-image-cnb-buildpack | 0.11.22  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| log-cache                       | 3.1.5    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| loggregator                     | 107.0.17 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| loggregator-agent               | 8.2.1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mapfs            | 1.4.0   | <p>▼ v1.4.0</p> <pre> ## 1.4.0 **Release Date**: September 25, 2024 ## Changes - Bump to Go 1.23 - Minor dependency bumps ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.3.0...v1.4.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.3.0...v1.4.0</a> ## Resources - [Download release 1.4.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.4.0). </pre>                                                                                                                                                              |
| metric-registrar | 4.0.3   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| mysql-monitoring | 10.16.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| nats             | 56.25.0 | <p>▼ v56.25.0</p> <pre> ## 56.25.0 **Release Date**: September 25, 2024 ## Changes - Bumped to Go 1.23 - [Catch or explicitly ignore unhandled errors](https://github.com/cloudfoundry/nats-release/commit/16979ee0aefdea96fb73af93008fa08b14ada92b) - Minor Dependency Bumps ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.24.0...v56.25.0">https://github.com/cloudfoundry/nats-release/compare/v56.24.0...v56.25.0</a> ## Resources - [Download release 56.25.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.25.0). </pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.4.0   | <p>▼ v7.4.0</p> <pre> ## 7.4.0 **Release Date**: October 01, 2024 ## Changes - Updates the nfsbrokerpush errand to apply the security group to staging containers as well as running, for greater success talking to credhub in test environments. Thanks @jochenehret! - Updates the BBR metadata to add more CAP I dependencies to resolve intermittent lock/unlock race conditions when running pre-restore actions in BBR. Thanks @davewalter! ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.3.0...v7.4.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.3.0...v7.4.0</a> ## Resources - [Download release 7.4.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.4.0). </pre> <p>▼ v7.3.0</p> <pre> ## 7.3.0 **Release Date**: September 30, 2024 ## Changes - [Output rpcbind and statd logs to a sensible place] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/bb54df64b42100c5c64b98a2818258f2a51cb79e">https://github.com/cloudfoundry/nfs-volume-release/commit/bb54df64b42100c5c64b98a2818258f2a51cb79e</a>) - [Add retries for monit statd and rpcbind check] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/03f06e61244424593f34b44e0b7a7dce06d6773">https://github.com/cloudfoundry/nfs-volume-release/commit/03f06e61244424593f34b44e0b7a7dce06d6773</a>) - [Remove sqlite] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/86327f2336dbfeadc2bb0389d981c41f6815750">https://github.com/cloudfoundry/nfs-volume-release/commit/86327f2336dbfeadc2bb0389d981c41f6815750</a>) - [Remove libevent and rpcsvc-proto] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/6e818a0ca00f79f8117d69eebab95a7273170239">https://github.com/cloudfoundry/nfs-volume-release/commit/6e818a0ca00f79f8117d69eebab95a7273170239</a>) - [Remove nfs-legacy option] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/bc3fb7a609434acb966fab601df110be18a2f0b">https://github.com/cloudfoundry/nfs-volume-release/commit/bc3fb7a609434acb966fab601df110be18a2f0b</a>) - [Output rpcbind and statd logs to a sensible place #1024] (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1024">https://github.com/cloudfoundry/nfs-volume-release/pull/1024</a>) - [Add retries for monit statd and rpcbind check #1027] (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1027">https://github.com/cloudfoundry/nfs-volume-release/pull/1027</a>) - [Add retries for monit statd and rpcbind check #1027] (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1027">https://github.com/cloudfoundry/nfs-volume-release/pull/1027</a>) - [Remove unneeded packages for nfs-debs #1](#) </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | 0.35    | <pre> ] (https://github.com/cloudfoundry/nfs-volume-release/pull/1035) - [Remove nfs-legacy option #1036 ] (https://github.com/cloudfoundry/nfs-volume-release/pull/1036) - Various Dependency Bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/nfsbrokerpush/spec b/jobs/nfsbrokerpush/spec index 9bf3138..bb67a94 100644 --- a/jobs/nfsbrokerpush/spec +++ b/jobs/nfsbrokerpush/spec @@ -97,29 +97,6 @@ properties: nfsbrokerpush.services: description: "List of services and plans supported by broker" default: - - id: nfsbroker - name: "nfs-legacy" - description: "Existing NFSv3 volumes (Deprecated)" - bindable: true - plan_updatable: false - tags: ["nfs"] - requires: ["volume_mount"] - metadata: - display_name: "Legacy NFS V3 Volume Broker" - image_url: data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAFQAAABdCAYAAAA7ZEEJAAAKw21DQ1BJQ0MgUHJvZmlsZQAASImVlgdUU1kax+976Y2WEIqUEOR3gJICT2AgnSwEZKQhBJCCip2ZXAEx4KICNjQEREFxwLIWBALFgYBex2QQUVdBws2VPYBS9jZPbt79p9zc3/5ct/3vu+9e8/5A0B+z5VKs2ANALI1C11MaAAjKTmFgXsCIOSDB5aAwuXJpezo6EiAaHL+qz7cRtYiumE3luvf//+v0uQL5DwAoGiE0/hyXjbCx5FxnyeVKQBAbULizgsV0jFG4oAmQwpE+PIYCyf44RinTfdQ+Jq4mEAA0GgA8GQuVyYEgIx0CBh5PCGSh+yIsKOEL5YgnIqwL0/E5SO8G+Hp2dk5Y9yBsFXap+UR/iVmionlytU8UQv48IHieXSL07i//Nx/G9lZykn72GGDLJ1FhaDzJZjzy0zJ0LFkrRZUZMs5o+vH2eRMix+knnywJRJ5nODIiZzmRnPnmSubOrafFFc4iTlcmJU+SVZsyJV+QUcFQvkwBGTnC4O4ajqUXDiJjlPnDBrkuWzsRFT9wpUxWXKGFXN2fKpetJ1Iap+RWKOar1CFBem6pE7VYNAnqSaqjs8IClbFjfGqNVJFgCqnNct6qpesUFVcnherulaBbLZJzuCGR0/1ivb1COKACCiBBPCBAMhAGsgBWUABGCAiiIEcSJFFXIBsFYVgkWKsucAc6WKZWChSMNjIiRIwOBKe/XSGs6MTc4Cx8znxt/Rx88dRL86FcttBcCzCAkKp2JcZJ+cfAoA9cNUzOwtsnWQs3W6i1eU5U3E0GNfGEAE6oAG9IARsr+sgB1wBu7AG/iDYBAopBoksF8wEP6yUY6WQiWglWgEBSDTWarqAC7wF5wABwGR0ETOAXOgUvgGugCt8AD0AsGwEswBD6AEQiCcBAFokJ6kDFkAd1CzhAl8oWCoUgoBkqGUiehJIGU0FJoDVQM1UAU0B6oFvoFOgmdg65A3dA9qA8ahN5CX2AUTIZpsCFsCTvALJgNR8Bx8DxYCOFC+XABvAEuh6vhQ3Ajfa6+Bt+Ce+GX8DAKoEgoOsoEZYdioQJRUagUVDpKh1qOKkKVoopR9agWVDvqBqoX9qr1GY1FU9EMtB3aGx2Gjkf </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|           |         | <p>z0Lno5ej16Ar0AXQj+gL6BroPPYT+jqFgDDC2GC8MB5OE<br/> EWIWYgoxZZj9mBOYi5hbhmAHMBywWS8cysR7YMGwyNgO7B<br/> LseuwPbgG3FdmP7scM4HE4PZ4vzwUXhuDgFrhC3HXcIdx<br/> bXgxvAfcKT8MZ4Z3wIPgUvwa/G1+EP4s/ge/DP8CMEDYI<br/> FwYsQReATFhM2EvYRWgjXCQOEaImkUn0IcYRM4iriOXE<br/> euJF4kPiOxKJZeryJM0miUkrSeWkI6TlpD7S7IW2YYCs<br/> J5LVpI3kGvIreR75HcUCsWS4k9JoSgoGyi1lPOUx5RPal<br/> Q1ezWOGL9thVqlWqNaj9prdYK6hTpbfb56vnqZ+jH16+q<br/> vNAgalhqBGlyN5RqVGic17mgMa1I1nTSjNLM112se1Lyi<br/> +vwlP2WpFazF1yrQ2qt1XqufiqKaUQOpPOoa6j7qReoAD<br/> Utj0ji0DFox7TCtzakraXtqp2gvUi7Uvu0di8dRbekc+<br/> hz9I30o/Tb9C86hjpsHYHOOp16nR6dj7rTdp11BbpFug2<br/> 6t3S/6DH0gvUy9TbrNek90kfr2+jP11+ov1P/ov6rabRp<br/> 3tn404qmHZ123wA2sDGIMVhisNegw2DY0Mgw1FBquN3wv<br/> OEri7qRv1GGUanRGaNBY6qxr7HYuNT4rPELhjaDzchild<br/> MuMIZMDEzCTJQme0w6TUZMmabxpqtNG0wfmrHNWGbpZqV<br/> mbWZD5sbmM82XmtEZ37cgWLAsRBbbLNotPloyLRMt11o2<br/> WT5n6j15zHxmHfOhFcXKzryXqtrqpjXWmmWdab3DussGt<br/> nGzEd1U21y3hW3dbcW202y7p20me06XTK+efseObMe2y7<br/> Ors+uzp9tH2q+2b7J/7WDukOKw2aHd4bujm2OW4z7HB05<br/> aTuFOq51anN462zjznCudb7pQXEJcVrg0u7xxtXUVuO50<br/> vetGdZvpttatze2bu4e7zL3efdDD3CPVo8rjDovGimatZ<br/> 132xHgGeK7wPOX52cvdS+F110tPbzvvTO+D3s9nMGcIZu<br/> yb0e9j6sP12ePT68vwTfxd7dvrZ+LH9av2e+Jv5s/33<br/> +//jG3NzmAfYr8OcAyQBZwI+BjoFbgsuDUIFRQaVBTUGa<br/> wVHB9cEfwm4xDREGFIXMhTqFroktDUMExYRtjnsDseQw+p<br/> UcobCPcKXhV+IIEfER1REPIm0iZRFtsyE24bP3DLz4SyL<br/> WZJZTVEgihO1JepRNDM6N/rX2djz0bMrzz+NcYpzGtMeS<br/> 41dEHsw9kNcQNzGuAfxVvHK+LYE9YS5CbUJHxODEksSe5<br/> MckpY1XUvWTxYnN6fgUhJS9qcMzwmes3X0wFy3uYVzb89<br/> jzls078p8/f1z808vUF/AXXAsFZOamHow9Ss3ilvNHU7j<br/> pFWldfecdt4L/n+/FL+oMBHUCJ4lu6TxpL+XOgj3CIcF<br/> PmJykSvxIHicvGbLCMXRkfM6MyazJHsxKzGrLx2anZJy<br/> VakkzJhRyjnEU53VJbaaGON9crd2vukCxct18OyefJmxU<br/> 0xAh1KK2UPyj78nzzKvM+LUXYeGyR5iLJoo7FNovXLX6W<br/> H5L/8xLOEt6StqUmS1ct7VvGXrZnObQ8bXnbCrMVBssGV<br/> oauPLCKuCpz1W+rHVeXrH6/JnFNS4FhwcqC/h9Cf6grVC<br/> uUFd5Z671214/oH8U/dq5zWbd93fciftHVYsfisuKv63n<br/> rr/7k9FP5T6Mb0jd0bnTfuHMTdpNk0+3NfpsPlGiW5Jf0<br/> b5m5pbGUUVpu+n7rgq1XylzLdm0jb1Nu6y2PLG/ebr59<br/> 0/avFaKKW5UB1Q1VB1Xrqj7u40/o2em/s36X4a7iXV92i<br/> 3ff3RO6p7HasrpsL3Zv3t6n+xL2tf/M+r12v/7+4v3fai<br/> Q1vQdiD1yo9aitPWhwcGMdXKesGzw091DX4aDDzfV29Xs<br/> a6A3FR8AR5ZEXv6T+cvtoxNG2Y6xj9cctjledoJ4aoaQa<br/> FzcCONYmaepuTm7tPhp9sa/FuOfGr/a81p0xOVZ7WPr3xD<br/> PFMwZnRs/lnh1ulra/OCc/1ty1oe3A+6fzNC7MvdF6MuH<br/> j5Usi18+3s9rOXfs6fuuJ15eRV1tWma+7XGjvcok785vb<br/> biU73zsbrHtebuzy7WrpnDj/p8es5dyPoqWbnJvXbs26<br/> 1X07/vbdO3Pv9N71331+L+vem/t590cerHyIeVj0SONR2<br/> WODx9W/W//e0Ovee7ovqK/jSeyTB/28/pd/yP/401Dw1P<br/> K07Jnx9rnzs9PDYYMdr2Y82Lgpft1yKvCv2n+req11ev<br/> jf/r/2TGUNDTwRvZm9036d3rvat67vm8bjh5+/CH7w8jh<br/> ok96nw58Zn1u/5L45dnIwqt4r+XfrI+1fI/4/nA0e3RUy<br/> pVxx60AChlwejoAb2sAoCQj3qELAOkcCf88LmjC848T+E<br/> 884bHH5Q5AjT8A8SsBiEQ8yk5kWCBMruYxyxTnD2AXF9X<br/> 4h+TpLs4TuciIC8V8Gh19ZwgArgWAb7LROZEdo6Pf9iHF<br/> 3gOgNXfCt48Ji3jxEqaOCe5BpwNzJfgX/R2N5g2xmShwc</p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|           |         | <p>wAAAZtpVFh0WE1MOmNvbS5hZG9iZS54bXAAAAAAADx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iIHg6eG1wdGs9I1hNUCBDb3J1IDUuNC4wIj4KICAgPHJkZjpsREYgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8x0Tk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj4KICAgICAgPHJkZjpeZXNjcmlwdGlvbiByZGY6YWJvdXQ9iIKICAgICAgiCAGICAgeG1sbnM6ZXhpZj0iaHR0cDovL25zLmFkb2J1LmNvbS9leGlmLzEuMC8iPgogICAgICAgICA8ZXhpZjpQaXh1bF1EaW11bnNpb24+OTM8L2V4aWY6UG14ZWxZRGltZW5zaW9uPgogICAgICA8L3jkZjpeZXNjcmlwdGlvbj4KICAgPC9yZGY6UkRGPgo8L3g6eG1wbWV0YT4KE9hEygAADTRJREFUeAHTXVtsHNUZ/ry7s3d7196s4xuJc3GEEExpiQahCASwiOJJSBdSkVdOqiAf61IqiSnlAPPJE2wcseSiUUCfUiJGQqe1EBJW31tmlQiWEGofimNgEG19315e9X9z/n9nZnZmd3aztsyYxc+Tjc5kz/5zzX8u+885/9+0Qg6WE4aATRgli5CMgAWoYEawABUMqEMwvRK5fGEFc4tpzEQTWExsJTMks9hOZXFcoLjFCY5P4dMLo9srkBhAbliqKY5z0YLkOw2SA4bnOTV0KFJuYQ7fG4Hmj108hJ85Dls9nCehIDPiS0BD8IBN+y2p19RUea1jMppTJ5fPzZEKY+W8C1mWXMLKrkaKeiKUSWUrgRp7smwrK12YW0Vg+2Br3oaPOge4sPfz0B705qgVNax6ddFaDzS2mcfedTDH8Sw5UJAnE2bv6CqdiOhwS75ICDvcOBJhtV1P6ammwUaua2FMeJeU8OS3nU5rzi2UoAhtxVIE4nt8QL0pkXyjIL6yUXqF0gYtwfrFMXgkLK3nks+xzyLHP5WRaxsrTo9BD4O7uDmDf91Z8daAbIQJ/Ne66gC6nchh6fxJnLnyK90bn5UbID6BGS05J8ZIEh4s8pwk8GwPYuF61mvaZluWek6dhJp/LIpTrfk4YZtOZEtjchoFdITx4Rw+O3N4Fr+v6I2RVQHnceuXvh+NXZz8Cd212DpcTPr8PnmYfXJ7VvTnT1t2gme1kGon1ZSSXEpABpnp6nHY89uAefPu+XXDYq3OLKaBv/28WP3v1fUxGEuBVf3NrC1ragjI33qAYNKxa2XQWi9EY1qKLYBi72rw49a39uKMvbPrMCKd/OxbFD3/xL/As7WnxozXc9oUE0ogWDw2xmXkkluLyKuGXP7oH/duCxmi8TzTdTcYFU6f/LYPZ0hpAe/dWC8wiPDxfhhs64CdcnmkYp2nCy+h0gL7yj1F5fehlzuzYYixrpQmBEOHibfYjFs9gkPAyOh2gH1yNyNf9wRZj0SutQcAfBjZT18ajmlwlqgP0Mq0v2Tndm3cGV5q9vv90t1smwPON0ekAVS9mUmklaoUmCGRSlWOnWswU0KXYonrdck0QWK6BjymgycV1RKfnTUhZWZGpOXnpVA0J099SNrsdi5EYstksAqHWTf2rqBowxvw0DYMLs1Ek1+NoIsnxCv2SNHOmgHbu6EGUF7HEqUlayPIk5Q8GaLnhhd1hN6OzKfPy+TxeHAd3cXvekZeU7SMFXBk3bbMpoCwhCtOipk2L2A9Bm0mSOG5qhjyIW91gom6vRxaiosRos7gCSU1y9FMzGU8QJyaQTiRLTXNRe/1Xo8urzPC1C4aIKaBqGb65s7ebBARZxJeWsbywhDSBy54di9gcxL0utxOSywUn/Zqw0cuwU5ew2ew3pMSJJU2FAkmaqMsWSIzHPymZ+9KpDLK8uuECRcfSM1+gmbwfEknU6nE1AVUJSCa7paEdzSSmCmkaI3l06kkEomkSVw2Zs5HovZ20myzgDbGGg5j0M1bi/KPs3uX00ey0DzJCMtUDctMFjkeZzbssAcn6epP8cvNcN+6BbmIk5s1sNTqAlRbAX6I/KCQksviLQY5Q6EswCUZY46Eufz21cb1ksMR443kWF7roE8mqhDcSWJJbpNE4XrdqgE1PpArVVYR5hiWjjPIBZ1zFK4pkES9QMLdUh5do35mJLuGNEn25aGGe0OxJ8hhuTcwiaxmi8f9dQNareU8vqoS/WplNm0+6cJ+MzZ0o9pkASoYaQtQC1DBCAgmZ3GoBahgBASTszjUA1QwAoLJWRxqASoYAcHkLA61ABWMgGBYfodagApGQDA5i0MtQAUjIJIicUAHz3ru248f99FVwxYb44gKe+v1k9eqG2vHcQ/SdiqTs8ZkInnpjWimr5nPfMf/0raMp2XJ4/c+jGNtuywi4cmvtGJfyAmvYbdxlk6hjE0tYfAvUxjWURKTEnr1lg14HvPSZwe</p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|           |         | <p>tsQnhLEM8e81WvZZD2W7qprNSEoE/zXtv82oLt5evx8ZL<br/>     TibB23+u+Hrz0aAcOtrsqwOTKSG4Jfb1tePqxXThWvXzr<br/>     viIUUNDhCq3r7e/CCW2GNm7+oRQw5GfpJEdtn0NcvSe0F<br/>     S8ea0H2g2+CTq6MfBbHyFwKC1nNtyvJhRPf34m7tXUSEN<br/>     ewhgBqRhI2CUEpd2Pw1Qnj1frs+TR++tJo3V1zb78fXpV<br/>     yPovXz4zgZcOjD9+zA4/d61FAd7px+HY3z19U34h689pD<br/>     sRxqrAeNgRjt4anZ9Y33GNLthnSt5IEtzf6YHzupAJPvH<br/>     Tp3FWfnyt/mw+HSK6hFu5rjQW0SL1m1790VVf1SV8ziT<br/>     lprKzmzl+jzRk01CRSdCSyzh0h1WgZ88uv1HhlnemxKzE<br/>     4dwTRxXvL1tz1V6Dsqa6vMu9FcjjarmxmC3S348XjPgxd<br/>     nsPl1/Qn/sYujOPxC/XRXG2phgHqzC3g1DsSfntQmemVr<br/>     h/DM2/pG1ezwnYXHjnSjc009DHjtyztJH7h3FyJxPC5KC<br/>     b7OpSXSLneoA9HaaVx9C7iRjrAO0FnUP1Y5eChq6hDiXp<br/>     9kYYBSntdgIvjGNrzj8MhZYde7z6a9d8awWB9daNSTdi7<br/>     K1C9dMGFYQJ0qFQig1N/tOG5r7ejS7urh16i185s9rHff<br/>     sCxQ3m0Vn02emMFa6V0yksWM01fH0a9OYLc0ByqvvV7<br/>     32rsC6W1cxxs7P4dSvh3H63RhGonSOs/RsDUnaFNa7rQ3<br/>     Pfnf7TbZsktsQwfPvN+PZA3Xn8czH2nWhJq26qKFLM6e<br/>     n8E4AWDe5dM4r7uhnBi6MImh4ji5d1cbDt7iR187HeVu0<br/>     dDy+PDEN7tx/nct5RvXGwtcl9dUjCeBoW3arn8Ljs3Eka<br/>     UyZkCVbqWNZSMfl1QFrVSuGLn71jaEfRKcNLYOX1ooXR4<br/>     ejYC94gJ48jj9kgoqk5fU4pa5tNqLKGpM9LwLq/Ww9j1<br/>     Hz1Em1g1yxy13JrD7i48cU8HTgyEcOy25hpkFvD8q9OYV<br/>     J9td2Jvd43iq7y0YYAC3PXLs6tE6izWqTxB31S3Zms6HT<br/>     8/Wdy/qi+kprTDTR6k1eKY20BAAbnrz2sb16wdwGgMEzy<br/>     GyM6Oow+T8KMKqCcf0lWA2vJ8Dpe0kiqVxBrDDR1DtXXj<br/>     rr/n8fJaUXttffE4Xr6cxNP7PQoZFn482o8HY21cnU9jN<br/>     rWCYNCF3rAbYZKGqW52YrFuWYF6T61QfU+1ygi+FseLmq<br/>     5fQdywnNIuJyvKGjKG/3MVg5+U2JSuNiEQdOMArWUF2Bf<br/>     EwW7SiqMBMzFPMtsz5R8GBnJrSgoGtNydm+ly3Fgz7vpa<br/>     AYX25AWIK0qQ00/tGePN1On/gSRML7y7gM1k9ednaZv68<br/>     JUZ/OA1ccsltVc6jQ73/uRPcv72/13q9Zs890HwPuJKX3<br/>     HtSSdAJqeWMTSx/11o/PKojM0/f/4NUUYbPobqnt7wRBx<br/>     DBsFIox8puMs3uro3Pn0LUMHvyALUA1QwAoLJWRxqASoY<br/>     AchkLA61ABWMgGByFodagApGQDA5i0MtQUajIJicxaEwo<br/>     IIREEzo41ALUMEICCZncagFqGAEBJPTcSibc2CXywg2yw<br/>     t+6M1OjtW7sVPx0rZHB+gBsirALhkv7/DQFrbiCgKsaJD<br/>     dw05Kxd86QE8e6ZMtwsySnkz1LsgkrP8qAtx7F+eishGW<br/>     k0d2q9mlUAfojg4/Tp3Yjxx9bp0emyCthRW7L0s3fhEjj<br/>     MfU+KeygsJnvjOA3q3+ChggPin/7c5b8M6Vebzx9jVMXr<br/>     0Gj88rm63w+ItbXcpIbo4M1n7J+kSX1gtIucju4S9vk42<br/>     tmLVct9FBlcCWBP52cQK/+esVXCV7SezY1i+HDkt42bAK<br/>     qYNspEI+tR6fV8iKEFOkzpPNVLCWX1VF5s7Oznzv/t24/<br/>     0APtd+8dqAAouyoZU3yftP0MVJ2S1XX2Pth6xf00nWtV<br/>     idsIVout/MqoTzpJqTu7OimJX0o8aTZJtJ2UDqpqOW9+3<br/>     vxEN39uDOPWEtNKbx6wKq3sUmqM5dmpLtK138mPQzp/Wb<br/>     1xlQPndpo1BRwkohAW+n7dx8jRVBq2ooWQNuo1rsGVQW<br/>     CGrqpiVbShxnOcIWbcpm27LkN5TCrx067Ljw04QHhjowb<br/>     23dcK1io2sdQ0qfSAb3+Kh4OLYPNjcxQcEsJmhEe09uji<br/>     pw1TAVXR7qlbAuB+xmkybYgasA1MyStZ8WLGoS7Jekg5<br/>     jyL0x5a9ivpJCTDWTarbgKZ7eGWC15037Wjd18jvp4010<br/>     ztbqnbpyprv10WsCVE9CSTHHTkeTm101MM226WJJ2U/LRv<br/>     7YoB97xcgf49Bor+8FFjpN5ycjf34y8tfida196FF8qxt<br/>     byeAfpzvJPpKbTj6LcsIArbdCDGY8TcDKACTAZ+jsC1tM<br/>     ZCtjGfJai4lyP11TLSXqQho62JoiW1Jkq4leArDZyyCSM<br/>     moyd8agbrTbcEA3uoEb/bzGzw4b3aLP+xn/BwZ8Dg1kGH<br/>     aWAAAAAE1FTkSuQmCC</p> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                          |         | <ul style="list-style-type: none"> <li>- long_description: "Legacy broker for existing NFSv3 volumes (deprecated)"</li> <li>- provider_display_name: "Dell / Pivotal"</li> <li>- documentation_url: <a href="https://docs.cloudfoundry.org/devguide/services/using-volumes.html">https://docs.cloudfoundry.org/devguide/services/using-volumes.html</a></li> <li>- plans:</li> <li>- id: Existing</li> <li>- name: "Existing"</li> <li>- description: "A preexisting filesystem"</li> <li>- metadata:</li> <li>- costs: <ul style="list-style-type: none"> <li>- amount:</li> <li>- usd: 0.0</li> <li>- unit: "MONTHLY"</li> <li>- display_name: "Existing Filesystems"</li> </ul> </li> <li>- id: "997f8f26-e10c-11e7-80c1-9a214cf093ae"</li> <li>- name: "nfs"</li> <li>- description: "Existing NFSv3 and v4 volumes (see: <a href="https://code.cloudfoundry.org/nfs-volume-release/">https://code.cloudfoundry.org/nfs-volume-release/</a>)"</li> <li>- ``</li> <li>## Built with go 1.23.1</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.2.0...v7.3.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.2.0...v7.3.0</a></li> <li>## Resources</li> <li>- [Download release 7.3.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.3.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.3.0</a>).</li> </ul> |
| nginx-offline-buildpack  | 1.2.19  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| nodejs-offline-buildpack | 1.8.29  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| notifications            | 73.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| notifications-ui         | 50.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| otel-collector           | 0.10.1  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.24  | <p>▼ 4.6.24</p> <pre>* Update buildpack to use Python 3   name   version   cf_stacks   modules    - - -    appdynamics   23.11.0-839   cflinuxfs3, c flinuxfs4       composer   2.7.8   cflinuxfs3, cflinuxfs4       httpd   2.4.62   cflinuxfs3       httpd   2.4.62   cflinuxfs4       newrelic   10.21.0.11   cflinuxfs3, cflin uxfs4       nginx   1.26.2   cflinuxfs3       nginx   1.26.2   cflinuxfs4       nginx   1.27.1   cflinuxfs3       nginx   1.27.1   cflinuxfs4       php   8.1.27   cflinuxfs3   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib     php   8.1.27   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib     php   8.1.28   cflinuxfs3   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib     php   8.1.28   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib  </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <pre> z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib      php   8.2.21   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib      php   8.2.21   cflinuxfs4   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib      php   8.2.22   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib      php   8.2.22   cflinuxfs4   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib   </pre> |  |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.9   cflinuxfs3   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqrl, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.9   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqrl, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.10   cflinuxfs3   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqrl, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.3.10   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqrl, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     python   3.12.4   cflinuxfs3       python   3.12.4   cflinuxfs4       ruby   3.0.5   cflinuxfs4     Default binary versions:   name   version    - -  </pre> |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |           | <pre>  php   8.1.27     httpd   2.4.62     newrelic   10.21.0.11     nginx   1.27.1     composer   2.7.8   * Uncached buildpack SHA256: ed76a0871e91a8c4fe3e84231a0fd36f34ad9484e735d1ed5b69d5841a6c5 * Uncached buildpack SHA256: c4ab75a2cb9c49cca2ea31f889e9e5421b9ab1902e4d8119d8aedfda65878e1b</pre>                                                                                                                                                                                                                                                                                                                                                                          |
| push-apps-manager-release  | 677.0.60  | <p>▼ 677.0.60</p> <pre>* Update underlying packages for security fixes</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| push-offline-docs-release  | 6.0.169   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| push-usage-service-release | 674.0.123 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| pxc                        | 1.0.31    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| python-offline-buildpack   | 1.8.29    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| r-offline-buildpack        | 1.2.15    | <p>▼ 1.2.15</p> <pre>* go.mod: update go version   name   version   cf_stacks   modules    - - -    r   4.2.3   cflinuxfs3   forecast, plumberr, rserv, shiny     r   4.2.3   cflinuxfs4   forecast, plumberr, rserv, shiny     r   4.3.3   cflinuxfs3   forecast, plumberr, rserv, shiny     r   4.3.3   cflinuxfs4   forecast, plumberr, rserv, shiny     r   4.4.1   cflinuxfs3   forecast, plumberr, rserv, shiny     r   4.4.1   cflinuxfs4   forecast, plumberr, rserv, shiny   * Uncached buildpack SHA256: e1bcd3e180619b8d6bb786e1eec637eed35774bdbe4dd059f36c066a9a3 * Uncached buildpack SHA256: 458413294b751e844e47483c9cf62e0557641b28ca700a9f05f2c063626322cd</pre> |
| routing                    | 0.311.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ruby-offline-buildpack     | 1.10.18   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| <b>Component</b>          | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| web-servers-cnb-buildpack | 0.15.2         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| silk                      | 3.51.0         | <p>▼ v3.51.0</p> <pre> ## 3.51.0 **Release Date**: September 24, 2024 ## Changes - Bump to Go 1.23.1 - [Fix file/dir creation permissions] (<a href="https://github.com/cloudfoundry/silk-release/commit/a085a2b0909ad849bce96e142381bdf67658990f">https://github.com/cloudfoundry/silk-release/commit/a085a2b0909ad849bce96e142381bdf67658990f</a>)   - [Catch or explicitly ignore unhandled errors] (<a href="https://github.com/cloudfoundry/silk-release/commit/460ea10df9e8b8d32179b53ac5e22e1fb58a4da">https://github.com/cloudfoundry/silk-release/commit/460ea10df9e8b8d32179b53ac5e22e1fb58a4da</a>) ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.50.0...v3.51.0">https://github.com/cloudfoundry/silk-release/compare/v3.50.0...v3.51.0</a> ## Resources - [Download release 3.51.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.51.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.51.0</a>). </pre> |
| smb-volume                | 3.5.0          | <p>▼ v3.5.0</p> <pre> ## 3.5.0 **Release Date**: September 26, 2024 ## Changes - Upgrade to Go 1.23! ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.4.0...v3.5.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.4.0...v3.5.0</a> ## Resources - [Download release 3.5.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.5.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.5.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| smoke-tests               | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.17  | <p>▼ 1.6.17</p> <pre>* Add nginx 1.26.2, remove nginx 1.26.1 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    nginx   1.26.2   cflinuxfs3     nginx   1.26.2   cflinuxfs4     nginx   1.27.1   cflinuxfs3     nginx   1.27.1   cflinuxfs4   Default binary versions:   name   version    -    nginx   1.27.x   * Uncached buildpack SHA256: f9dc7ebcb9ea51 cfbe86340d70ba32e410e48fb85e47a37cd2bd92bd9ca f6bec * Uncached buildpack SHA256: e289a59b95eea4 81acdf2c19df5f7321d25a24da06236d460a007910dc1 1a18e</pre> |
| statsd-injector              | 1.11.43 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| syslog                       | 12.3.3  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| system-metrics-scraper       | 4.0.11  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| uaa                          | 77.16.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| tanzu-jammy-stack            | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## 6.0.8

Release Date: 09/27/2024



### Caution

This release is affected by a memory leak in the route registrar job, which is present on multiple VMs. To mitigate this issue see the following [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- **[Feature]** Allow operators to configure the number of local workers per Cloud Controller API VM
- **[Feature]** Users can configure the innodb buffer pool for the internal MySQL database
- **[Feature Improvement]** Cloud Controller Web Server now uses percentage based memory thresholds
- **[Feature Improvement]** Optionally log revision id in app log sources.
- **[Feature Improvement]** Reduce unnecessary mysql disk writes

- **[Bug Fix]** Add full path to stacks property in migration to set cflinuxfs4 as default stack
- **[Bug Fix]** Migrate DB Encryption Key
- **[Bug Fix]** Removes STOPPING state from CAPI v3 process stats API
- Bump backup-and-restore-sdk to version [1.19.33](#)
- Bump bpm to version [1.3.2](#)
- Bump capi to version [1.193.0](#)
- Bump cf-autoscaling to version [250.3.2](#)
- Bump cf-cli to version [1.67.0](#)
- Bump cf-networking to version [3.50.0](#)
- Bump cflinuxfs3 to version [0.407.0](#)
- Bump credhub to version [2.12.91](#)
- Bump diego to version [2.103.0](#)
- Bump dotnet-core-offline-buildpack to version [2.4.33](#)
- Bump garden-runc to version [1.56.0](#)
- Bump go-offline-buildpack to version [1.10.22](#)
- Bump java-offline-buildpack to version [4.73.0](#)
- Bump log-cache to version [3.1.5](#)
- Bump loggregator to version [107.0.17](#)
- Bump loggregator-agent to version [8.2.1](#)
- Bump mapfs to version [1.3.0](#)
- Bump metric-registrar to version [4.0.3](#)
- Bump mysql-monitoring to version [10.16.0](#)
- Bump nats to version [56.24.0](#)
- Bump nfs-volume to version [7.2.0](#)
- Bump nginx-offline-buildpack to version [1.2.19](#)
- Bump nodejs-offline-buildpack to version [1.8.29](#)
- Bump notifications to version [73.0.0](#)
- Bump otel-collector to version [0.10.1](#)
- Bump php-offline-buildpack to version [4.6.23](#)
- Bump push-apps-manager-release to version [677.0.56](#)
- Bump push-usage-service-release to version [674.0.123](#)
- Bump pxc to version [1.0.31](#)
- Bump python-offline-buildpack to version [1.8.29](#)

- Bump r-offline-buildpack to version 1.2.14
- Bump routing to version 0.311.0
- Bump ruby-offline-buildpack to version 1.10.18
- Bump silk to version 3.50.0
- Bump smb-volume to version 3.4.0
- Bump staticfile-offline-buildpack to version 1.6.16
- Bump statsd-injector to version 1.11.43
- Bump syslog to version 12.3.3
- Bump system-metrics-scraper to version 4.0.11
- Bump uaa to version 77.16.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.572   |               |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk | 1.19.33 | <p>▼ v1.19.33</p> <pre>## Changes * Add final release 1.19.32 [ci skip]</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                        |         | <p>▼ v1.19.32</p> <pre>## Changes * Add final release 1.19.31 [ci skip] * Call docker compose as a plugin * Install version of bundler listed in Gemfile.lock * Merge pull request #1816 from xtreme-nitin-ravindran/fix-sdk-template-unit-tests * Pull closed source repos from Github Enterprise [skip ci] * Unzip ruby-install before make-ing it * Update bundler version to match the output of the bump-ruby job * update pipeline to use the aws iaas director * update sdk-template-unit-tests to use ruby-install as an input</pre>                                                       |
|                        |         | <p>▼ v1.19.31</p> <pre>## Changes * Add final release 1.19.30 [ci skip] * Golang: Updated to v1.23.0. (#1807) * Use bosh-ecosystem-docker-image and ruby-install * do not use cryogenics shared image to bump ruby * move create-pr task from cryogenics shared repo to here ## Dependencies * **v2:** Updated to v2.20.2. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **gomega:** Updated to v1.34.2. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>).</pre> |
|                        |         | <p>▼ v1.19.30</p> <pre>## Changes * Add final release 1.19.29 [ci skip] ## Dependencies * **v2:** Updated to v2.20.2. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **gomega:** Updated to v1.34.2. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>).</pre>                                                                                                                                                                                                      |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |         | <p>thub.com/onsi/gomega).<br/>       * <b>**api:**</b> Updated to v0.195.0.<br/>       For more information, see [api](<a href="https://github.com/googleapis/google-api-go-client">https://github.com/googleapis/google-api-go-client</a>).</p> <p>▼ v1.19.29</p> <pre>## Changes * Add final release 1.19.28 [ci skip] * Bump mariadb from 10.6.17 to 10.6.19 (#1781) * Bump postgresql from 13.15 to 13.16 (#1780)  ## Dependencies * <b>bosh-backup-and-restore:</b> Updated to v1.9.68. For more information, see [bosh-backup-and-restore](<a href="https://github.com/cloudfoundry-incubator/bosh-backup-and-restore">https://github.com/cloudfoundry-incubator/bosh-backup-and-restore</a>). * <b>v2:</b> Updated to v2.20.1. For more information, see [v2](<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * <b>**api:**</b> Updated to v0.194.0. For more information, see [api](<a href="https://github.com/googleapis/google-api-go-client">https://github.com/googleapis/google-api-go-client</a>).</pre> <p>▼ v1.19.28</p> <pre>## Changes * Add final release 1.19.27 [ci skip]</pre> |
| binary-offline-buildpack | 1.1.13  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| bpm                      | 1.3.2   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| capi                     | 1.193.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| cf-autoscaling           | 250.3.2 | <p>▼ v250.3.2</p> <pre>## What's Changed * Bump dependencies * Bump packaged golang to go1.22.7 * Explicitly handle NoResourceFoundException by @acostall in <a href="https://github.com/pivotal-cf/cf-autoscaling-release/pull/995">https://github.com/pivotal-cf/cf-autoscaling-release/pull/995</a> **Full Changelog**: <a href="https://github.com/pivotal-cf/cf-autoscaling-release/compare/v250.3.1...v250.3.2">https://github.com/pivotal-cf/cf-autoscaling-release/compare/v250.3.1...v250.3.2</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component | Version | Release Notes                                                                                                                                                                                                                                                               |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-cli    | 1.67.0  | <p>▼ v1.67.0</p> <div style="border: 1px solid #ccc; padding: 5px;"><p>### Included CF CLI versions:</p><p>7.7.14<br/>8.8.2</p></div> <p>▼ v1.66.0</p> <div style="border: 1px solid #ccc; padding: 5px;"><p>### Included CF CLI versions:</p><p>7.7.12<br/>8.8.0</p></div> |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.50.0  | <p>▼ v3.50.0</p> <pre>## 3.50.0 **Release Date**: September 11, 2024 ## Changes - Bump to golang 1.22.7 - Dependency updates ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.49.0...v3.50.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.49.0...v3.50.0</a> ## Resources - [Download release 3.50.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.50.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.50.0</a>).</pre> <p>▼ v3.49.0</p> <pre>## 3.49.0 **Release Date**: August 27, 2024 ## Changes - Bumps healthchecker-boshrelease vendored packages ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.48.0...v3.49.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.48.0...v3.49.0</a> ## Resources - [Download release 3.49.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.49.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.49.0</a>).</pre> <p>▼ v3.48.0</p> <pre>## 3.48.0 **Release Date**: August 20, 2024 ## Changes - Update dependancies ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.47.0...v3.48.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.47.0...v3.48.0</a> ## Resources - [Download release 3.48.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.48.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.48.0</a>).</pre> |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs3       | 0.407.0        | <p>▼ v0.407.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.407.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.407.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.407.0</a>)</p> </div> <p>▼ v0.406.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.406.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.406.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.406.0</a>)</p> </div> <p>▼ v0.405.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.405.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.405.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.405.0</a>)</p> </div> <p>▼ v0.404.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.404.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.404.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.404.0</a>)</p> </div> <p>▼ v0.403.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.403.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.403.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.403.0</a>)</p> </div> <p>▼ v0.402.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.402.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.402.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.402.0</a>)</p> </div> <p>▼ v0.401.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.401.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.401.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.401.0</a>)</p> </div> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |         | <p>▼ v0.400.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.400.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.400.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.400.0</a>)</p></div> <p>▼ v0.399.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.399.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.399.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.399.0</a>)</p></div> <p>▼ v0.392.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.392.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.392.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.392.0</a>)</p></div> |
| cflinuxfs4            | 1.107.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub   | 2.12.91 | <p>▼ 2.12.91</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.90...2.12.91">https://github.com/pivotal/credhub-release/compare/2.12.90...2.12.91</a></pre> <p>▼ 2.12.90</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.89...2.12.90">https://github.com/pivotal/credhub-release/compare/2.12.89...2.12.90</a></pre> <p>▼ 2.12.89</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.88...2.12.89">https://github.com/pivotal/credhub-release/compare/2.12.88...2.12.89</a></pre> <p>▼ 2.12.88</p> <pre>## What's Changed * Bumped Tomcat version to 9.0.91 to address [CVE-2024-34750] (<a href="https://nvd.nist.gov/vuln/detail/CVE-2024-34750">https://nvd.nist.gov/vuln/detail/CVE-2024-34750</a>). * Done other various dependency bumps. **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.87...2.12.88">https://github.com/pivotal/credhub-release/compare/2.12.87...2.12.88</a></pre> <p>▼ 2.12.87</p> <pre>## What's Changed * Build(deps): Bump parallel from 1.25.1 to 1.26.2 in /spec by @dependabot in <a href="https://github.com/pivotal/credhub-release/pull/232">https://github.com/pivotal/credhub-release/pull/232</a> * Build(deps): Bump rexml from 3.3.4 to 3.5 in /spec by @dependabot in <a href="https://github.com/pivotal/credhub-release/pull/233">https://github.com/pivotal/credhub-release/pull/233</a> **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.86...2.12.87">https://github.com/pivotal/credhub-release/compare/2.12.86...2.12.87</a></pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.103.0 | <p>▼ v2.103.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 2.103.0 **Release Date**: September 12, 2024 ## Changes - Go dependency bumps - Remove toolchain directive for compatibility when building binaries ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.102.0...v2.103.0">https://github.com/cloudfoundry/diego-release/compare/v2.102.0...v2.103.0</a> ## Resources - [Download release 2.103.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.103.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.103.0</a>).</pre></div> |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.33  | <p>▼ 2.4.33</p> <pre>* tests: avoid using chrome-driver chrome-driver was removed from the CI image in https://github.com/cloudfoundry/buildpacks- ci/pull/413.    name   version   cf_stacks    - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.33   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.8   cflinuxfs3, c flinuxfs4     dotnet-runtime   6.0.33   cflinuxfs3, cfl inuxfs4     dotnet-runtime   8.0.8   cflinuxfs3, cfli nuxfs4     dotnet-sdk   6.0.425   cflinuxfs3, cflinu xfs4     dotnet-sdk   8.0.401   cflinuxfs3, cflinu xfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4    Default binary versions:   name   version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 802a207cca016c 6f5fc6522d6c0db680bc0004b1c88a26313cdcab1f81e f060e * Uncached buildpack SHA256: 3c06e16103cd4b 765ace7a914781acdc10d9085252e7473d46192baca0b 84693</pre> |
|                               |         | <p>▼ 2.4.32</p> <pre>* Update dotnet-sdk to 6.0.425, remove dotn et-sdk 6.0.424 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 6.0.33, remove dotn et-aspnetcore 6.0.32 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 8.0.8, remove dotne t-aspnetcore 8.0.7 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 8.0.8, remove dotnet-r untime 8.0.7 for stack(s) cflinuxfs4, cflinuxfs3</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>* Add dotnet-runtime 6.0.33, remove dotnet-runtime 6.0.32</li> <li>  for stack(s) cflinuxfs4, cflinuxfs3</li> <li>  * Add dotnet-sdk 8.0.401, remove dotnet-sdk 8.0.303</li> <li>  for stack(s) cflinuxfs4, cflinuxfs3</li> <li>  * Add node 20.16.0, remove node 20.15.1</li> <li>  for stack(s) cflinuxfs3, cflinuxfs4</li> <li>    name   version   cf_stacks  </li> <li>   - - -</li> <li>    bower   1.8.14   cflinuxfs3, cflinuxfs4  </li> <li>    dotnet-aspnetcore   6.0.33   cflinuxfs3, cflinuxfs4  </li> <li>    dotnet-aspnetcore   8.0.8   cflinuxfs3, cflinuxfs4  </li> <li>    dotnet-runtime   6.0.33   cflinuxfs3, cflinuxfs4  </li> <li>    dotnet-runtime   8.0.8   cflinuxfs3, cflinuxfs4  </li> <li>    dotnet-sdk   6.0.425   cflinuxfs3, cflinuxfs4  </li> <li>    dotnet-sdk   8.0.401   cflinuxfs3, cflinuxfs4  </li> <li>    libgdiplus   6.1   cflinuxfs3  </li> <li>    libgdiplus   6.1   cflinuxfs4  </li> <li>    libunwind   1.8.1   cflinuxfs3  </li> <li>    libunwind   1.8.1   cflinuxfs4  </li> <li>    node   20.16.0   cflinuxfs3  </li> <li>    node   20.16.0   cflinuxfs4  </li> <li>  Default binary versions:</li> <li>    name   version  </li> <li>   - - </li> <li>    dotnet-runtime   8.0.x  </li> <li>    dotnet-aspnetcore   8.0.x  </li> <li>    dotnet-sdk   8.0.x  </li> <li>    bower   1.8.x  </li> <li>  * Uncached buildpack SHA256: 2d77d9e18f0ea076590600776a04c73fff2b62f9b474ca443981cc01def5add9</li> <li>  * Uncached buildpack SHA256: 533ca33c4dde68e2590241242d80884fdc2a5e5e10ff3e46ec8a8f3aebf1a8d8</li> </ul> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.56.0  | <p>▼ v1.56.0</p> <pre> ## 1.56.0 **Release Date**: September 11, 2024 ## Changes - Introduces a new `garden.read_header_timeout` property to configure how long garden's HTTP server will wait to read all HTTP request headers. - Bumps to go 1.22.7 - Dependency Bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/garden-windows/spec b/jobs/garden-windows/spec index 004e4e7f..74f545db 100644 --- a/jobs/garden-windows/spec +++ b/jobs/garden-windows/spec @@ -36,6 +36,10 @@ properties: description: "An array of additional arguments which will be passed to the runtime plugin binary" default: [] + garden.read_header_timeout: +   description: "The amount of time allowed to read request headers" +   default: 30s + garden.image_plugin: description: "Path to an image plugin binary" diff --git a/jobs/garden/spec b/jobs/garden/spec index 093e53e1..5a78d357 100644 --- a/jobs/garden/spec +++ b/jobs/garden/spec @@ -128,6 +128,10 @@ properties: description: "Path to a runtime plugin binary" default: /var/vcap/packages/runc/bin/runc + garden.read_header_timeout: +   description: "The amount of time allowed to read request headers" +   default: 30s + garden.no_image_plugin: description: "If true, disables image plugin usage, thus ignoring other image plugin settings" default: false ``` ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.55.0...v1.56.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.55.0...v1.56.0</a> ## Resources - [Download release 1.56.0 from bosh.io](ht </pre> |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |         | <p><a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.56.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.56.0</a>.</p> <p>▼ v1.55.0</p> <pre> ## 1.55.0 **Release Date**: August 27, 2024 ## Changes - Bump to golang 1.22.6 ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.54.0...v1.55.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.54.0...v1.55.0</a> ## Resources - [Download release 1.55.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.55.0). </pre>                                                                                                            |
| go-offline-buildpack            | 1.10.22 | <p>▼ 1.10.22</p> <pre> * Add go 1.21.13, remove go 1.21.12 for stack(s) cflinuxfs4, cflinuxfs3 * Add go 1.22.6, remove go 1.22.5 for stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - - -   dep   0.5.4   cflinuxfs3     dep   0.5.4   cflinuxfs4     glide   0.13.3   cflinuxfs3     glide   0.13.3   cflinuxfs4     go   1.21.13   cflinuxfs3     go   1.21.13   cflinuxfs4     go   1.22.6   cflinuxfs3     go   1.22.6   cflinuxfs4     godep   80   cflinuxfs3     godep   80   cflinuxfs4   Default binary versions:   name   version    - -    go   1.21.x   * Uncached buildpack SHA256: f0f318ee6b00f97e8778ee7b642d45c7380c6b5752ebfebcebe287a1051a95ae * Uncached buildpack SHA256: d1c24c4f4f5b978a0a0bd922bcfedcc02738e8fc05a5372c6d31f1b06e67d0bb </pre> |
| java-offline-buildpack          | 4.73.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| java-native-image-cnb-buildpack | 0.11.22 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache | 3.1.5   | <p>▼ v3.1.5</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.7 ## New Contributors * @acostall made their first contribution in <a href="https://github.com/cloudfoundry/log-cache-release/pull/533">https://github.com/cloudfoundry/log-cache-release/pull/533</a> * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/log-cache-release/pull/538">https://github.com/cloudfoundry/log-cache-release/pull/538</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.4...v3.1.5">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.4...v3.1.5</a></pre> <p>▼ v3.1.4</p> <pre>## What's Changed △ Nothing has changed between v3.1.3 and v3.1.4 △ **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.3...v3.1.4">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.3...v3.1.4</a></pre> <p>▼ v3.1.3</p> <pre>## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.2...v3.1.3">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.2...v3.1.3</a></pre> <p>▼ v3.1.2</p> <pre>## What's Changed * Bump to code.cloudfoundry.org/go-log-cache/v3 and go-loggregator/v10 by @oppegard in <a href="https://github.com/cloudfoundry/log-cache-release/pull/523">https://github.com/cloudfoundry/log-cache-release/pull/523</a> * Bump to Go1.22 by @aqstack in <a href="https://github.com/cloudfoundry/log-cache-release/pull/525">https://github.com/cloudfoundry/log-cache-release/pull/525</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.1...v3.1.2">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.1...v3.1.2</a></pre> |

| Component   | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator | 107.0.17 | <p>▼ v107.0.17</p> <div style="border: 1px solid black; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.7 ## New Contributors * @acostall made their first contribution * @iprotsiuk made their first contribution **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.16...v107.0.17">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.16...v107.0.17</a></pre></div> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.2.1   | <p>▼ v8.2.1</p> <pre>## What's Changed * Fix loggr-forwarder-agent-windows to emit all OTLP signals by default by @ctlong in https://github.com/cloudfoundry/loggregator-agent-release/pull/611 * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.0...v8.2.1">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.0...v8.2.1</a></pre> <p>▼ v8.2.0</p> <pre>## What's Changed * Bump to Golang 1.22.7 * Emit all OTel signals by default by @mkocher in https://github.com/cloudfoundry/loggregator-agent-release/pull/609 * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.7...v8.2.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.7...v8.2.0</a></pre> <p>▼ v8.1.7</p> <pre>## What's Changed * Bump dependencies * Fix flaky unit tests by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/604 * Ignore linter warnings for G115 by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/607 * Fix uint to int conversion for otelcolclient by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/608 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.6...v8.1.7">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.6...v8.1.7</a></pre> <p>▼ v8.1.6</p> <pre>## What's Changed * Δ the `temporary_enable_otel_traces` property has been renamed to `enable_otel_traces`. Since this was prefixed as temporary this release is not a major version bump. * Add support to send LOG and EVENT to Otel Collector as logs by @mkocher in https://github.com/cloudfoundry/loggregator-agent-release/pull/603. For backwards compatibility `enable_otel_metrics` is true by default, and `ena</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>ble_otel_traces` and `enable_otel_logs` are false by default. * Bump dependencies ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/600">https://github.com/cloudfoundry/loggregator-agent-release/pull/600</a> * @jriguera contributed log support for OTLP forwarding **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.5...v8.1.6">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.5...v8.1.6</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| mapfs     | 1.3.0   | <p>▼ v1.3.0</p> <pre>## 1.3.0 **Release Date**: September 16, 2024 ## Changes - Mapfs-release has been refactored to remove submodules and localize all documentation ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.2.80...v1.3.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.2.80...v1.3.0</a> ## Resources - [Download release 1.3.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.3.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.3.0</a>).</pre> <p>▼ v1.2.80</p> <pre>## 1.2.80 **Release Date**: August 27, 2024 ## Changes - Bumped to golang 1.22.6 - Many CI + testing changes/improvements - Dependency bumps ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.2.79...v1.2.80">https://github.com/cloudfoundry/mapfs-release/compare/v1.2.79...v1.2.80</a> ## Resources - [Download release 1.2.80 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.2.80">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.2.80</a>).</pre> |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| metric-registrar | 4.0.3   | <p>▼ v4.0.3</p> <pre>## What's Changed * Bump dependencies * Bump packaged golang to go1.22.7 **Full Changelog**: <a href="https://github.com/pivotal-cf/metric-registrar-release/compare/v4.0.2...v4.0.3">https://github.com/pivotal-cf/metric-registrar-release/compare/v4.0.2...v4.0.3</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| mysql-monitoring | 10.16.0 | <p>▼ v10.16.0</p> <pre>### Release Notes - mysql-diag reports the node to bootstrap - mysql-diag will timeout when querying nodes takes too long - Update golang to 1.23.0 - Dependency bumps</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| nats             | 56.24.0 | <p>▼ v56.24.0</p> <pre>## 56.24.0 **Release Date**: September 06, 2024 ## Changes - Updated dependencies ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.23.0...v56.24.0">https://github.com/cloudfoundry/nats-release/compare/v56.23.0...v56.24.0</a> ## Resources - [Download release 56.24.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.24.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.24.0</a>).</pre> <p>▼ v56.23.0</p> <pre>## 56.23.0 **Release Date**: August 20, 2024 ## Changes - Update dependancies ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.22.0...v56.23.0">https://github.com/cloudfoundry/nats-release/compare/v56.22.0...v56.23.0</a> ## Resources - [Download release 56.23.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.23.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.23.0</a>).</pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.2.0   | <p>▼ v7.2.0</p> <pre> ## 7.2.0 **Release Date**: September 11, 2024 ## Changes - Add dockerdriver-integration errand - Move nfsv3driver and nfsbroker into the release - Bump to go1.22.7 - Update processes to sync with [runtime ci](https://github.com/cloudfoundry/wg-app-platform-runtime-ci) and update release to be on Minor versions - Update bosh blobs to latest - Update ldap test server configuration to have the correct users for tests - Remove support for cf cli v6 ## Bosh Job Spec changes: ```diff diff --git a/jobs/dockerdriver-integration/spec b/jobs/dockerdriver-integration/spec new file mode 100644 index 000000..51e7835 --- /dev/null +++ b/jobs/dockerdriver-integration/spec @@ -0,0 +1,22 @@ +- +name: dockerdriver-integration + +templates: +  pre-start.erb: bin/pre-start +  run.erb: bin/run +  config.json.erb: config/config.json + +packages: +- dockerdriver-integration +- nfs-debs +- nfsv3driver + + +properties: +  nfs_remote_path: +    description: Address for SMB Remote Path +    default: nfs://nfstestserver.service.c f.internal/export + +  mapfs_path: +    description: "Path to mapfs binary" +    default: /var/vcap/packages/mapfs/bin/ mapfs diff --git a/jobs/nfstestldapserver/spec b/jobs/nfstestldapserver/spec index ec232e3..0408886 100644 --- a/jobs/nfstestldapserver/spec +++ b/jobs/nfstestldapserver/spec @@ -9,7 +9,8 @@ templates: </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>config/core.ldif: config/core.ldif config/core.schema: config/core.schema config/addou.ldif: config/addou.ldif - config/adduser.ldif: config/adduser.ldif + config/adduser1000.ldif: config/adduser1000.ldif + config/adduser2000.ldif: config/adduser2000.ldif helpers/ctl_setup.sh: helpers/ctl_setup.sh helpers/ctl_utils.sh: helpers/ctl_utils.sh slapd.ldif.erb: config/slapd.ldif ``` ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.1.7...v7.2.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.1.7...v7.2.0</a> ## Resources - [Download release 7.2.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.2.0).</pre> |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack | 1.2.19  | <p>▼ 1.2.19</p> <pre>* Rebuild openresty 1.21.4.3 and 1.25.3.2 with http2 support (github.com/cloudfoundry/buildpacks-ci/pull/414)   name   version   cf_stacks    - -    nginx   1.26.1   cflinuxfs3     nginx   1.26.1   cflinuxfs4     nginx   1.27.1   cflinuxfs3     nginx   1.27.1   cflinuxfs4     openresty   1.21.4.3   cflinuxfs3     openresty   1.21.4.3   cflinuxfs4     openresty   1.25.3.2   cflinuxfs3     openresty   1.25.3.2   cflinuxfs4   Default binary versions:   name   version    - -    nginx   1.27.x   * Uncached buildpack SHA256: b6be6ffda779ba f5d5475fa94042f9f7ef81cf1e92bbd74ce01f35081ab 85c9a * Uncached buildpack SHA256: e6353aaea7aa4f bb467b71cc2bd8c61d9b78328d606747611e87c6cdc5e 87f69</pre>                                                                       |
|                         |         | <p>▼ 1.2.18</p> <pre>* Add nginx 1.27.1, remove nginx 1.27.0 for stack(s) cflinuxfs3, cflinuxfs4 * Add openresty 1.25.3.2, remove openresty 1.25.3.1 for stack(s) cflinuxfs3, cflinuxfs4 * Missing popd (#298)   name   version   cf_stacks    - -    nginx   1.26.1   cflinuxfs3     nginx   1.26.1   cflinuxfs4     nginx   1.27.1   cflinuxfs3     nginx   1.27.1   cflinuxfs4     openresty   1.21.4.3   cflinuxfs3     openresty   1.21.4.3   cflinuxfs4     openresty   1.25.3.2   cflinuxfs3     openresty   1.25.3.2   cflinuxfs4   Default binary versions:   name   version    - -    nginx   1.27.x   * Uncached buildpack SHA256: a813c5406445dd f60e84aa98c1104e42eb85f7577fb66c4ddcb4111f8a7 7495f * Uncached buildpack SHA256: b9c4ac6f876753 dfee99ebae34c4259969f0e823304d6e519dcc38a06be</pre> |

| Component | Version | Release Notes |
|-----------|---------|---------------|
|           |         | b5e73         |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.29  | <p>▼ 1.8.29</p> <pre>* Add node 22.8.0, remove node 22.5.0 for stack(s) cflinuxfs4 * Add python 3.11.10, remove python 3.11.9 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    node   18.20.3   cflinuxfs3     node   18.20.3   cflinuxfs4     node   18.20.4   cflinuxfs3     node   18.20.4   cflinuxfs4     node   20.15.1   cflinuxfs3     node   20.15.1   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4     node   22.7.0   cflinuxfs4     node   22.8.0   cflinuxfs4     python   3.11.10   cflinuxfs3     python   3.11.10   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: 9a453c3aa87acd 00d913ed3fac55d6d80de57ee211d283b60397238fe83 b61c0 * Uncached buildpack SHA256: 60ebe66ac680b1 f6aa30a65835c43ae2f08327c41f6ed10121f79552ccf fcd00</pre> |
|                          |         | <p>▼ 1.8.28</p> <pre>* Add node 22.7.0, remove node 22.3.0 for stack(s) cflinuxfs4 * Add node 20.16.0, remove node 20.15.0 for stack(s) cflinuxfs3, cflinuxfs4 * fix: npm version command (#740) * fix reading yarn version continuation of #740 with tests added (#75 7)   name   version   cf_stacks    - -    node   18.20.3   cflinuxfs3     node   18.20.3   cflinuxfs4     node   18.20.4   cflinuxfs3     node   18.20.4   cflinuxfs4     node   20.15.1   cflinuxfs3     node   20.15.1   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4     node   22.5.0   cflinuxfs4     node   22.7.0   cflinuxfs4     python   3.11.9   cflinuxfs3  </pre>                                                                                                                                                                                                                                                            |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  python   3.11.9   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: 3328070bd9b0e2 860c26ecbe13e674138e61473edd9e431b8c92244d2fd 62104 * Uncached buildpack SHA256: fe181dddefe788e c0dc9ac197064fbdb83dd6e273cef4be93227588780df 5e60e</pre> |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications | 73.0.0  | <p>▼ v73.0.0</p> <pre> commit 737cb4f9dcde053e3a1634fc97d37632ec6b 2823 Author: PCF Toronto Concourse CI Bot Date:   Fri Sep 13 16:29:38 2024 +0000 Cuts final release 73.0.0 [ci skip] commit 42e9d3af5a84d920b7f32a81a6353b85b594 21a3 Author: PCF Event Alerts Team CI Date:   Fri Sep 13 15:58:54 2024 +0000 Bump submodule src/notifications commit fee08991918040aac09a5e292defdcecf6b4 4628 Author: PCF Event Alerts Team CI Date:   Fri Sep 13 15:56:07 2024 +0000 Bump submodule src/notifications commit e5c48784ebaf7b9dd3780306c96e1ceba8e6 5cee Author: PCF Event Alerts Team CI Date:   Fri Sep 13 15:50:38 2024 +0000 Bump submodule src/notifications commit 4f4ddb5b56f89dee559885f57f2f61e62471 f533 Merge: 5c9f4b1 747892e Author: Benjamin Fuller Date:   Fri Sep 13 09:48:27 2024 -0600 Merge pull request #64 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/gomega-1.34.2 Bump github.com/onsi/gomega from 1.33.1 to 1.34.2 in /src/acceptance commit 747892eae31dd0d24306219629b2bbcd6fc bcec Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Fri Sep 13 15:42:32 2024 +0000 Bump github.com/onsi/gomega from 1.33.1 to 1.34.2 in /src/acceptance Bumps [github.com/onsi/gomega] (https://github.com/onsi/gomega) from 1.33.1 to 1.34.2. - [Release notes] (https://github.com/onsi/gomega/releases) - [Changelog] (https://github.com/onsi/gomega/blob/master/CHANGELOG.md) - [Commits] (https://github.com/onsi/gomega/compare/v1.33.1...v1.34.2) --- updated-dependencies: - dependency-name: github.com/onsi/gomega dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot] commit 5c9f4b12f17ebb3c3c9b9fb301937a425bf9 5631 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> Merge: b2ff00d 9bae175 Author: Benjamin Fuller Date:   Fri Sep 13 09:41:21 2024 -0600 Merge pull request #65 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/ginkgo/v2-2.20.2 Bump github.com/onsi/ginkgo/v2 from 2.19.0 to 2.20.2 in /src/acceptance commit b2ff00d926ce30303c891a05e944ad28b1c04444 Author: PCF Event Alerts Team CI Date:   Thu Sep 5 16:08:56 2024 +0000 bump-golang to v0.157.0 commit 9bae175cf95009dd5c51d724388eea280b0761db Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Mon Sep 2 22:43:41 2024 +0000 Bump github.com/onsi/ginkgo/v2 from 2.19.0 to 2.20.2 in /src/acceptance Bumps [github.com/onsi/ginkgo/v2](https://github.com/onsi/ginkgo) from 2.19.0 to 2.20.2. - [Release notes](https://github.com/onsi/ginkgo/releases) - [Changelog](https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md) - [Commits](https://github.com/onsi/ginkgo/compare/v2.19.0...v2.20.2) --- updated-dependencies: - dependency-name: github.com/onsi/ginkgo/v2 dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot] commit af9ef53d9602c5212e73b57663d298000416bb84 Author: PCF Event Alerts Team CI Date:   Mon Sep 2 16:16:16 2024 +0000 bump-golang to v0.156.0 commit 7f0c083d5cb5ef145c8135ca91fedc231e4859e2 Author: PCF Event Alerts Team CI Date:   Tue Aug 6 18:24:41 2024 +0000 bump-golang to v0.155.0 commit 5c53531ad0a5161c5b62e8ab381d2359b9d63567 Merge: 1742216 5003204 Author: Benjamin Fuller Date:   Tue Jul 23 21:39:18 2024 -0600 Merge pull request #59 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/ginkgo/v2-2.19.0 Bump github.com/onsi/ginkgo/v2 from 2.17.1 to 2.19.0 in /src/acceptance commit 5003204cffd4770682b7df58f541acacdccb </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> 181b Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Wed Jul 24 03:37:59 2024 +0000 Bump github.com/onsi/ginkgo/v2 from 2.17.1 to 2.19.0 in /src/acceptance   Bumps [github.com/onsi/ginkgo/v2] (https://github.com/onsi/ginkgo) from 2.17.1 to 2.19.0.     - [Release notes] (https://github.com/onsi/ginkgo/releases)     - [Changelog] (https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md)     - [Commits] (https://github.com/onsi/ginkgo/compare/v2.17.1...v2.19.0)     ---     updated-dependencies:       - dependency-name: github.com/onsi/ginkgo/v2         dependency-type: direct:production         update-type: version-update:semver-minor         ...         Signed-off-by: dependabot[bot]         commit 1742216979de802aa0351e833acdbf67b4b5 c1e6         Merge: f964197 941595a         Author: Benjamin Fuller         Date:   Tue Jul 23 21:36:46 2024 -0600         Merge pull request #57 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/gomega-1.33.1           Bump github.com/onsi/gomega from 1.32.0 to           1.33.1 in /src/acceptance           commit 941595a33bc6e71fa5d8040af7d6aec3dd1d 4535           Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;           Date:   Tue Jul 23 20:45:24 2024 +0000           Bump github.com/onsi/gomega from 1.32.0 to           1.33.1 in /src/acceptance           Bumps [github.com/onsi/gomega] (https://github.com/onsi/gomega) from 1.32.0 to 1.33.1.             - [Release notes] (https://github.com/onsi/gomega/releases)             - [Changelog] (https://github.com/onsi/gomega/blob/master/CHANGELOG.md)             - [Commits] (https://github.com/onsi/gomega/compare/v1.32.0...v1.33.1)             ---             updated-dependencies:               - dependency-name: github.com/onsi/gomega                 dependency-type: direct:production                 update-type: version-update:semver-minor                 ...                 Signed-off-by: dependabot[bot] </pre> |

| Component        | Version | Release Notes |
|------------------|---------|---------------|
| notifications-ui | 49.0.0  |               |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| otel-collector | 0.10.1  | <p>▼ v0.10.1</p> <pre>## What's Changed * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.10.0...v0.10.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.10.0...v0.10.1</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                |         | <p>▼ v0.10.0</p> <pre>## What's Changed * Add 'splunk_hec' exporter, 'filter' processor, and 'transform' processor by @mkocher in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/51">https://github.com/cloudfoundry/otel-collector-release/pull/51</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.9.0...v0.10.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.9.0...v0.10.0</a></pre>                                                                                                                                                                                                                                                                                                                                                     |
|                |         | <p>▼ v0.9.0</p> <pre>## What's Changed * feat: Add CPU limit by @aqstack in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/46">https://github.com/cloudfoundry/otel-collector-release/pull/46</a> * fix: config secret interpolation by @acostall in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/49">https://github.com/cloudfoundry/otel-collector-release/pull/49</a> ## New Contributors * @acostall made their first contribution in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/49">https://github.com/cloudfoundry/otel-collector-release/pull/49</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.1...v0.9.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.1...v0.9.0</a></pre> |
|                |         | <p>▼ v0.8.1</p> <pre>## What's Changed * Automatically configure nop pipelines in config when necessary by @iprotsiuk in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/48">https://github.com/cloudfoundry/otel-collector-release/pull/48</a> ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/48">https://github.com/cloudfoundry/otel-collector-release/pull/48</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.0...v0.8.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.0...v0.8.1</a></pre>                                                                                                                                                  |
|                |         | <p>▼ v0.8.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>## What's Changed * add integration tests by @mkocher in https://github.com/cloudfoundry/otel-collector-release/pull/45 * Feat: Add secrets property by @ctlong in https://github.com/cloudfoundry/otel-collector-release/pull/47 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.7.0...v0.8.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.7.0...v0.8.0</a></pre> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.23  | <p>▼ 4.6.23</p> <pre>* Update nginx to 1.26.2 for stack(s) cflinuxfs4, cflinuxfs3 * Add composer 2.7.8, remove composer 2.7.7 for stack(s) cflinuxfs4, cflinuxfs3 * Add php 8.2.22, remove php 8.2.20 for stack(s) cflinuxfs4, cflinuxfs3 * Add httpd 2.4.62, remove httpd 2.4.61 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks   modules    - - -    appdynamics   23.11.0-839   cflinuxfs3, cflinuxfs4       composer   2.7.8   cflinuxfs3, cflinuxfs4             httpd   2.4.62   cflinuxfs3       httpd   2.4.62   cflinuxfs4       newrelic   10.21.0.11   cflinuxfs3, cflinuxfs4       nginx   1.26.2   cflinuxfs3       nginx   1.26.2   cflinuxfs4       nginx   1.27.1   cflinuxfs3       nginx   1.27.1   cflinuxfs4       php   8.1.27   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lz4, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.27   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lz4, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.28   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lz4, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> e, pdo_sqlsrv, pgsql, phalcon, phppredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.28   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phppredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.2.21   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phppredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.2.21   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phppredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.2.22   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phppredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.2.22   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.9   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.9   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.10   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.10   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|                           |          | <pre> dy, xdebug, xsl, yaml, zip, zlib     python   2.7.18   cflinuxfs4         ruby   3.0.5   cflinuxfs4       Default binary versions:   name   version    - -    php   8.1.27     httpd   2.4.62     newrelic   10.21.0.11     nginx   1.27.1     composer   2.7.8   * Uncached buildpack SHA256: 431dfd80786a39 a518d9cff7495882892c9a86d541ba32cc9be6e033ec7 aa389 * Uncached buildpack SHA256: 131be2eb923de8 d27b6effe23231b3d6f0ba88522e5a62e1aa544d6a5ba8 7b3de </pre>                                                                                                                                                                    |
| push-apps-manager-release | 677.0.56 | <p>▼ 677.0.56</p> <div style="border: 1px solid #ccc; padding: 5px;"> <ul style="list-style-type: none"> <li>* update usage service display to show deleted services with same name as other service</li> </ul> </div> <p>▼ 677.0.55</p> <div style="border: 1px solid #ccc; padding: 5px;"> <ul style="list-style-type: none"> <li>* fix css for delete button visibility</li> <li>* fix kerning issues causing overhangs when underscores present.</li> </ul> </div> <p>▼ 677.0.54</p> <div style="border: 1px solid #ccc; padding: 5px;"> <pre>## What's Changed * update css casing to not effect user data * update dependencies</pre> </div> |
| push-offline-docs-release | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.123 | <p>▼ v674.0.123</p> <pre>## Changes * creating final release 674.0.122</pre> <p>▼ v674.0.122</p> <pre>## Changes * creating final release 674.0.121</pre> <p>▼ v674.0.121</p> <pre>## Changes * creating final release 674.0.120 ## Dependencies * **app-usage-service:** Updated to v`044bf48`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> <p>▼ v674.0.120</p> <pre>## Changes * creating final release 674.0.119 ## Dependencies * **app-usage-service:** Updated to v`25139d8`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> |
| pxc                        | 1.0.31    | <p>▼ v1.0.31</p> <pre>## Release Notes **New Features** - Enable users to set `engine_config.binlog.sync=0` - Enable users to set `kernel.vm.swappiness=1` - Enable users to set `engine_config.innodb_flush_method=O_DIRECT` - Enable users to set `engine_config.additional_raw_entries` **Dependency bumps** - Updates packages and dependencies</pre>                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.29  | <p>▼ 1.8.29</p> <pre> * Switch to miniforge   name   version   cf_stacks    - -    libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniconda3-py39   24.7.1   cflinuxfs3, cflinuxfs4     pip   24.2   cflinuxfs3, cflinuxfs4     pipenv   2024.0.1   cflinuxfs3     pipenv   2024.0.1   cflinuxfs4     python   3.8.19   cflinuxfs3     python   3.8.19   cflinuxfs4     python   3.9.19   cflinuxfs3     python   3.9.19   cflinuxfs4     python   3.10.14   cflinuxfs3     python   3.10.14   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     python   3.12.5   cflinuxfs3     python   3.12.5   cflinuxfs4     setuptools   73.0.1   cflinuxfs3, cflinuxfs4    Default binary versions:   name   version    - -    python   3.10.x   * Uncached buildpack SHA256: 277460b2f4ad1be0903ff29685dea0dac682a30de7d703b53f8559759ad384d6 * Uncached buildpack SHA256: af719af45385d5b1f620eda1750df2302984002ac8d5adbedc8a6ecdf9f17ffb </pre> <p>▼ 1.8.28</p> <pre> * Add python 3.12.5, remove python 3.12.4 for stack(s) cflinuxfs3, cflinuxfs4 * Add miniconda3-py39 24.7.1, remove miniconda3-py39 24.5.0 for stack(s) cflinuxfs4, cflinuxfs3 * Update setuptools to 73.0.1 for stack(s) cflinuxfs4, cflinuxfs3 * Update pip to 24.2 for stack(s) cflinuxfs4, cflinuxfs3 * Bump to latest go in bootstrap script &amp; go.mod * Use cflinuxfs4 as default for testing on switchblade * Add pipenv 2024.0.1, remove pipenv 2023.1.2.1 for stack(s) cflinuxfs4, cflinuxfs3 * Remove dependency credential test   name   version   cf_stacks   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>   - - -    libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniconda3-py39   24.7.1   cflinuxfs3, cflinuxfs4     pip   24.2   cflinuxfs3, cflinuxfs4     pipenv   2024.0.1   cflinuxfs3     pipenv   2024.0.1   cflinuxfs4     python   3.8.19   cflinuxfs3     python   3.8.19   cflinuxfs4     python   3.9.19   cflinuxfs3     python   3.9.19   cflinuxfs4     python   3.10.14   cflinuxfs3     python   3.10.14   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     python   3.12.5   cflinuxfs3     python   3.12.5   cflinuxfs4     setuptools   73.0.1   cflinuxfs3, cflinuxfs4    Default binary versions:   name   version    - -    python   3.10.x   * Uncached buildpack SHA256: 43bb8e7a6a2db936d78799273a40bf2104474e59cc25b94827f751693d5d1e4b * Uncached buildpack SHA256: 66651848c12fbc35f7a81fe55fea7e59f33ea302fbda7a7678af785832dcaceef </pre> |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| r-offline-buildpack | 1.2.14  | <p>▼ 1.2.14</p> <pre>* Rebuild r 4.2.3 for stack(s) cflinuxfs3, cflinuxfs4 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.1 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.1 * Rebuild r 4.3.3 for stack(s) cflinuxfs4, cflinuxfs3 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.1 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.1 * Rebuild r 4.4.1 for stack(s) cflinuxfs3, cflinuxfs4 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.1 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.1 * Rebuild r 4.2.3 for stack(s) cflinuxfs4, cflinuxfs3 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.0 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.0 * Rebuild r 4.3.3 for stack(s) cflinuxfs3, cflinuxfs4 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.0 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.0 * Rebuild r 4.4.1 for stack(s) cflinuxfs4, cflinuxfs3 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.0 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.9.0   name   version   cf_stacks   modules    - - - -    r   4.2.3   cflinuxfs3   forecast, plumbe r, rserve, shiny     r   4.2.3   cflinuxfs4   forecast, plumbe r, rserve, shiny     r   4.3.3   cflinuxfs3   forecast, plumbe</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>r, rserve, shiny     r   4.3.3   cflinuxfs4   forecast, plumbe r, rserve, shiny     r   4.4.1   cflinuxfs3   forecast, plumbe r, rserve, shiny     r   4.4.1   cflinuxfs4   forecast, plumbe r, rserve, shiny   * Uncached buildpack SHA256: 87344cefdb4d58 2127a98b62922d87a68f44f86f6c0da8c91b2d9c97d42 a6339 * Uncached buildpack SHA256: f5c88c4b35e034 72cf9c7f1bdf1cff194d39b7fc6f0ae0580edf74c71f0 d0b47</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.311.0 | <p>▼ v0.311.0</p> <pre>## 0.311.0 **Release Date**: September 12, 2024 ## Changes - Fix route-registrar dynamic config YAML field names to match JSON names ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.310.0...v0.311.0">https://github.com/cloudfoundry/routing-release/compare/v0.310.0...v0.311.0</a> ## Resources - [Download release 0.311.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.311.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.311.0</a>).</pre>                                                                                                                                                                               |
|           |         | <p>▼ v0.310.0</p> <pre>## 0.310.0 **Release Date**: September 09, 2024 ## Changes - dep: bump gopkg.in/yaml from v2 to v3; adjusted submodules listed in [routing-release#435] (<a href="https://github.com/cloudfoundry/routing-release/pull/435">https://github.com/cloudfoundry/routing-release/pull/435</a>) - minor dependency bumps ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.309.0...v0.310.0">https://github.com/cloudfoundry/routing-release/compare/v0.309.0...v0.310.0</a> ## Resources - [Download release 0.310.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.310.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.310.0</a>).</pre> |
|           |         | <p>▼ v0.309.0</p> <pre>## 0.309.0 **Release Date**: September 06, 2024 ## Changes - Dependency bumps ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.308.0...v0.309.0">https://github.com/cloudfoundry/routing-release/compare/v0.308.0...v0.309.0</a> ## Resources - [Download release 0.309.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.309.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.309.0</a>).</pre>                                                                                                                                                                                                                                      |
|           |         | <p>▼ v0.308.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## 0.308.0 **Release Date**: September 04, 2024 ## Changes - Route Registrar now allows hosts to be configured per route - By default it will use the top level host config ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.307.0...v0.308.0">https://github.com/cloudfoundry/routing-release/compare/v0.307.0...v0.308.0</a> ## Resources - [Download release 0.308.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.308.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.308.0</a>). </pre>                                                                                                                                                                                                                           |
|           |         | <p>▼ v0.307.0</p> <pre> ## 0.307.0 **Release Date**: August 27, 2024 ## Changes - Bump healthchecker-boshrelease vendored packages ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.306.0...v0.307.0">https://github.com/cloudfoundry/routing-release/compare/v0.306.0...v0.307.0</a> ## Resources - [Download release 0.307.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.307.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.307.0</a>). </pre>                                                                                                                                                                                                                                                                          |
|           |         | <p>▼ v0.306.0</p> <pre> ## 0.306.0 **Release Date**: August 26, 2024 ## Changes - Fixes a bug where TCP routes were incorrectly detected as existing records in routing-api when the only difference between the new route and existing record was that the SNI Hostname or TLS TCP Port were different. This resulted in backends for TLS TCP Routes being ignored in certain scenarios. ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.305.0...v0.306.0">https://github.com/cloudfoundry/routing-release/compare/v0.305.0...v0.306.0</a> ## Resources - [Download release 0.306.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.306.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.306.0</a>). </pre> <p>▼ v0.305.0</p> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## 0.305.0 **Release Date**: August 23, 2024 ## Changes - Route-registrar can dynamically scan and register routes at paths matching `route_regi strar.dynamic_config_globs` ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jo bs/route_registrar/spec index feafaf10..4f887265 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -94,6 +94,10 @@ properties:   route_registrar.routing_api.server_ca_cert:     description: "Routing API Certificate Autho     rity" +   route_registrar.dynamic_config_globs: +     description: "Files matching the globs       contain routes configuration that will be loa       ded dynamically. Parent directory must exist       for bpm to mount it." +     default: [/var/vcap/jobs/*/config/rout e_registrar/config.yml] +   route_registrar.routes:     description:         (required, array of objects): Routes that w       ill be registered ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/clou dfoundry/routing-release/compare/v0.304.0...v 0.305.0">https://github.com/cloudfoundry/routing-releas e/compare/v0.304.0...v0.305.0</a> ## Resources - [Download release 0.305.0 from bosh.io](h <a href="https://bosh.io/releases/github.com/cloudfound ry/routing-release?version=0.305.0">https://bosh.io/releas es/github.com/cloudfoundry/routing-release?version=0.305.0</a>). </pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack | 1.10.18 | <p>▼ 1.10.18</p> <pre>* Update to ruby 3.2.5 for stack(s) cflinuxfs4, cflinuxfs3 * Update to bundler 2.5.18 for stack(s) cflinuxfs4, cflinuxfs3 * Update to rubygems 3.5.18 for stack(s) cflinuxfs4, cflinuxfs3 * Updated to node 20.16.0 for stack(s) cflinuxfs3, cflinuxfs4 * No gemfile test: Use manifest to set health-check-type pull in https://github.com/cloudfoundry/switchblade/pull/113 * fix tests: fs3 envs do not have go_buildpack See https://github.com/cloudfoundry/nodejs-buildpack/pull/692 * Migrate test suite to switchblade (#977) - delete low-value tests.   name   version   cf_stacks    - -    bundler   2.5.18   cflinuxfs3, cflinuxfs4     jruby   9.4.8.0   cflinuxfs3     jruby   9.4.8.0   cflinuxfs4     node   20.16.0   cflinuxfs3     node   20.16.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.5   cflinuxfs3     ruby   3.1.5   cflinuxfs4     ruby   3.1.6   cflinuxfs3     ruby   3.1.6   cflinuxfs4     ruby   3.2.4   cflinuxfs3     ruby   3.2.4   cflinuxfs4     ruby   3.2.5   cflinuxfs3     ruby   3.2.5   cflinuxfs4     ruby   3.3.2   cflinuxfs3     ruby   3.3.2   cflinuxfs4     ruby   3.3.4   cflinuxfs3     ruby   3.3.4   cflinuxfs4     rubygems   3.5.18   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    ruby   3.2.x   * Uncached buildpack SHA256: 3fb82af561bbc665c661ea47eb70576592822ae6b1d5b6980ffd4e86d0a32e92 * Uncached buildpack SHA256: 3cc59a349fde04742761eea91947992a272b0b06537b2b6eef973460598</pre> |

| Component                 | Version | Release Notes |
|---------------------------|---------|---------------|
|                           |         | e660e         |
| web-servers-cnb-buildpack | 0.15.2  |               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.50.0  | <p>▼ v3.50.0</p> <pre> ## 3.50.0 **Release Date**: September 11, 2024 ## Changes - Bumps to go 1.22.7 - Dependency bumps - Fixes an issue in vxlan-policy-agent where certain chains were not cleaned up properly - Adjusts how ASG related iptables chain names are generated in vxlan-policy-agent to provide more uniqueness, and better error messaging on collisions. ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.49.0...v3.50.0">https://github.com/cloudfoundry/silk-release/compare/v3.49.0...v3.50.0</a> ## Resources - [Download release 3.50.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.50.0). </pre> |
|           |         | <p>▼ v3.49.0</p> <pre> ## 3.49.0 **Release Date**: August 27, 2024 ## Changes - Bumps healthchecker-boshrelease vendored packages ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.48.0...v3.49.0">https://github.com/cloudfoundry/silk-release/compare/v3.48.0...v3.49.0</a> ## Resources - [Download release 3.49.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.49.0). </pre>                                                                                                                                                                                                                                          |
|           |         | <p>▼ v3.48.0</p> <pre> ## 3.48.0 **Release Date**: August 20, 2024 ## Changes - Update dependancies ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.47.0...v3.48.0">https://github.com/cloudfoundry/silk-release/compare/v3.47.0...v3.48.0</a> ## Resources - [Download release 3.48.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.48.0). </pre>                                                                                                                                                                                                                                                                        |

| Component | Version | Release Notes |
|-----------|---------|---------------|
|           |         |               |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume | 3.4.0   | <p>▼ v3.4.0</p> <pre>## 3.4.0 **Release Date**: September 17, 2024 ## Changes - Add documentation - Removed support for cf cli v6 ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.2.0...v3.4.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.2.0...v3.4.0</a> ## Resources - [Download release 3.4.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.4.0).</pre> <p>▼ v3.2.0</p> <pre>## 3.2.0 **Release Date**: August 20, 2024 ## Changes - Added dockerdriver-integration errand - Moved `smbbroker` and `smbdriver` into the release instead of having them as submodule - Standardize blob name to match garden-run c and other releases - Fixed an error with smbtestserver when it couldn't be deployed twice in a row - Move config for smbtestserver into the bo sh job instead - Allow consuming username and password for smbtestserver - Fix a bug with smbtestserver to allow the correct CIDR range for access - Allow SMB version 3.1.1 for broker since the move to Jammy stemcells [More context](https://learn.microsoft.com/en-us/azure/storage/files/storage-how-to-use-files-linux?tabs=Ubuntu%2Csmb311) - Bump to golang 1.22.6 - Update processes to sync with [runtime ci](https://github.com/cloudfoundry/wg-app-platfrom-runtime-ci) and update release to be on Minor versions ## Bosh Job Spec changes: ```diff diff --git a/jobs/dockerdriver-integration/spec b/jobs/dockerdriver-integration/spec new file mode 100644 index 0000000..a269658 --- /dev/null +++ b/jobs/dockerdriver-integration/spec @@ -0,0 +1,21 @@ +name: dockerdriver-integration +</pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |         | <pre>+templates: +  pre-start.erb: bin/pre-start +  run.erb: bin/run +  config.json.erb: config/config.json + +packages: +- cifs-utils +- dockerdriver-integration +- smbdriver + +consumes: +- name: smbtestserver +  type: credentials + +properties: +  smb_remote_path: +    description: Address for SMB Remote Path +    default: //smbtestserver.service.cf.internal/vol diff --git a/jobs/smbtestserver/spec b/jobs/smbtestserver/spec index 6e4d88d..de9a091 100755 --- a/jobs/smbtestserver/spec +++ b/jobs/smbtestserver/spec @@ -2,11 +2,19 @@ name: smbtestserver templates: -  install.erb: bin/pre-start +  smb.conf.erb: config/smb.conf +  pre-start.erb: bin/pre-start   ctl.erb: bin/smbtestserver_ctl packages: [] +provides: +- name: smbtestserver +  type: credentials +  properties: +    - username +    - password + properties: export_cidr: description: "cidr range to use for smb exports" ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.1.7...v3.2.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.1.7...v3.2.0</a> ## Resources - [Download release 3.2.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.2.0).</pre> |
| smoke-tests | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.16  | <p>▼ 1.6.16</p> <pre>* Add nginx 1.27.1, remove nginx 1.27.0 for stack(s) cflinuxfs3, cflinuxfs4 * Remove dependency credential test (#435) * Update libbuildpack   name   version   cf_stacks    - - -   nginx   1.26.1   cflinuxfs3     nginx   1.26.1   cflinuxfs4     nginx   1.27.1   cflinuxfs3     nginx   1.27.1   cflinuxfs4   Default binary versions:   name   version    - -   nginx   1.27.x   * Uncached buildpack SHA256: 05a4f4a5294cca f8788640d971c1f34f4313e272e78931349e5d5693389 b2fee * Uncached buildpack SHA256: 907b11df2de85e b1ad5eef99ea2c174d3da6868c7b5f6a91710b4a0bee0 9e48f</pre> |
| statsd-injector              | 1.11.43 | <p>▼ v1.11.43</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/clo">https://github.com/clo</a> dfoundry/statsd-injector-release/compare/v1.1 1.42...v1.11.43</pre>                                                                                                                                                                                                                                                                                                                                                               |
| syslog                       | 12.3.3  | <p>▼ v12.3.3</p> <pre>## What's Changed * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/clo">https://github.com/clo</a> dfoundry/syslog-release/compare/v12.3.2...v1 2.3.3</pre> <p>▼ v12.3.2</p> <pre>## What's Changed * Bump packaged Golang to go1.22.6 **Full Changelog**: <a href="https://github.com/clo">https://github.com/clo</a> dfoundry/syslog-release/compare/v12.3.1...v1 2.3.2</pre>                                                                                                                                                                           |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                            |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| system-metrics-scraper | 4.0.11  | <p>▼ v4.0.11</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/cilium/cilium/releases/compare/v4.0.10...v4.0.11">https://github.com/cilium/cilium/releases/compare/v4.0.10...v4.0.11</a></pre></div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa       | 77.16.0 | <p>▼ v77.16.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.16.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.16.0) ### Dependency Bumps * [Upgrade Tomcat to version 9.0.94] (https://github.com/cloudfoundry/uaa-release/commit/7d82bf9648e30eaaa0e49b816860923c52e7db42) * [Upgrade Tomcat to version 9.0.95] (https://github.com/cloudfoundry/uaa-release/commit/30411859d5aacb1248e48ff5a84de3aff9ba180d) * Bump github.com/cloudfoundry/bosh-utils from 0.0.483 to 0.0.484 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/941 * Bump minitest from 5.25.0 to 5.25.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/942 * Bump rspec-expectations from 3.13.1 to 3.13.2 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/944 * Bump activesupport from 7.2.0 to 7.2.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/945 * Bump github.com/cloudfoundry/bosh-utils from 0.0.484 to 0.0.485 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/947 * Bump github.com/onsi/gomega from 1.34.1 to 1.34.2 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/948 * Bump rspec-core from 3.13.0 to 3.13.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/952 * Bump logger from 1.6.0 to 1.6.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/951 * Bump github.com/cloudfoundry/bosh-utils from 0.0.485 to 0.0.486 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/950 * Bump github.com/cloudfoundry/bosh-utils from 0.0.486 to 0.0.494 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/955 * Bump github.com/cloudfoundry/bosh-utils from 0.0.494 to 0.0.495 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/957 * Bump rspec-expectations from 3.13.2 to 3.13.3 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/956 * Bump github.com/cloudfoundry/bosh-utils from 0.0.495 to 0.0.496 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/958 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ts by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/961">https://github.com/cloudfoundry/uaa-release/pull/961</a></p> <ul style="list-style-type: none"> <li>* Bump i18n from 1.14.5 to 1.14.6 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/962">https://github.com/cloudfoundry/uaa-release/pull/962</a></li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.15.0...v77.16.0">https://github.com/cloudfoundry/uaa-release/compare/v77.15.0...v77.16.0</a></li> </ul> <p>▼ v77.15.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Add configuration option for origin loop by @strehle in <a href="https://github.com/cloudfoundry/uaa-release/pull/923">https://github.com/cloudfoundry/uaa-release/pull/923</a> * Bump github.com/onsi/gomega from 1.33.1 to 1.34.0 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/926">https://github.com/cloudfoundry/uaa-release/pull/926</a> * Bump nokogiri from 1.16.6 to 1.16.7 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/927">https://github.com/cloudfoundry/uaa-release/pull/927</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.479 to 0.0.480 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/929">https://github.com/cloudfoundry/uaa-release/pull/929</a> * Bump github.com/onsi/gomega from 1.34.0 to 1.34.1 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/931">https://github.com/cloudfoundry/uaa-release/pull/931</a> * Bump racc from 1.8.0 to 1.8.1 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/930">https://github.com/cloudfoundry/uaa-release/pull/930</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.480 to 0.0.482 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/935">https://github.com/cloudfoundry/uaa-release/pull/935</a> * Bump concurrent-ruby from 1.3.3 to 1.3.4 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/936">https://github.com/cloudfoundry/uaa-release/pull/936</a> * Bump activesupport from 7.1.3.4 to 7.2.0 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/937">https://github.com/cloudfoundry/uaa-release/pull/937</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.482 to 0.0.483 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/938">https://github.com/cloudfoundry/uaa-release/pull/938</a> * Bump minitest from 5.24.1 to 5.25.0 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/940">https://github.com/cloudfoundry/uaa-release/pull/940</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.14.0...v77.15.0">https://github.com/cloudfoundry/uaa-release/compare/v77.14.0...v77.15.0</a></pre> </div> |

| Component         | Version | Release Notes |
|-------------------|---------|---------------|
| tanzu-jammy-stack | 1.0.1   |               |

## 6.0.7

**Release Date:** 08/22/2024

- **[Feature]** Add Beta support for Puma webserver in Cloud Controller
- **[Feature]** Adds support for Cloud Controller Prometheus Metrics
- **[Bug Fix]** Fixes known issue [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#)
- **[Bug Fix]** Resolves an issue with routing-api's migration leading to broken TCP Routes when TAS uses a Postgres database
- **[Bug Fix]** Turn off ccdb paginate window to improve performance
- **[Feature Improvement]** Improved the Appsmanager User Interface. Contrast improvements and new font for improved readability.
- **[Feature Improvement]** Improved Appsmanager performance by increasing Cloud Controller request page size.
- Bump backup-and-restore-sdk to version [1.19.27](#)
- Bump bpm to version [1.3.0](#)
- Bump capi to version [1.189.0](#)
- Bump cf-autoscaling to version [250.3.1](#)
- Bump cflinuxfs3 to version [0.391.0](#)
- Bump credhub to version [2.12.86](#)
- Bump diego to version [2.102.0](#)
- Bump garden-runc to version [1.54.0](#)
- Bump java-offline-buildpack to version [4.72.0](#)
- Bump java-native-image-cnb-buildpack to version [0.11.22](#)
- Bump loggregator to version [107.0.16](#)
- Bump loggregator-agent to version [8.1.5](#)
- Bump metric-registrar to version [4.0.2](#)
- Bump nats to version [56.22.0](#)
- Bump nodejs-offline-buildpack to version [1.8.27](#)
- Bump notifications-ui to version [49.0.0](#)
- Bump otel-collector to version [0.7.0](#)
- Bump push-apps-manager-release to version [677.0.53](#)

- Bump push-usage-service-release to version 674.0.119
- Bump r-offline-buildpack to version 1.2.13
- Bump routing to version 0.304.0
- Bump web-servers-cnb-buildpack to version 0.15.2
- Bump statsd-injector to version 1.11.42
- Bump syslog to version 12.3.1
- Bump system-metrics-scraper to version 4.0.10

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.506   |               |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk | 1.19.27 | <p>▼ v1.19.27</p> <pre> ## Changes * Add final release 1.19.26 [ci skip] * Bump postgresql from 15.7 to 15.8 (#1779) * Golang: Updated to v1.22.6. (#1771) ## Dependencies * **bosh-backup-and-restore:** Updated to v1.9.67. For more information, see [bosh-backup-and-restore](https://github.com/cloudfoundry-incubator/bosh-backup-and-restore). * **v2:** Updated to v2.20.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.34.1. For more information, see [gomega](https://github.com/onsi/gomega). * **net:** Updated to v0.28.0. For more information, see [net](https://github.com/golang/net). * **oauth2:** Updated to v0.22.0. For more information, see [oauth2](https://github.com/golang/oauth2). * **api:** Updated to v0.191.0. For more information, see [api](https://github.com/googleapis/google-api-go-client). </pre> |
|                        |         | <p>▼ v1.19.26</p> <pre> ## Changes * Add final release 1.19.25 [ci skip] * Do not do "@all" in gchat notification * Merge pull request #1759 from cloudfoundry/no-draft-releases * Merge pull request #1760 from cloudfoundry/no-gchat-all * No longer publish draft Github releases * Update gChat webhook to new team channel ## Dependencies * **v2:** Updated to v2.19.1. For more information, see [v2](https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.34.0. For more information, see [gomega](https://github.com/onsi/gomega). </pre>                                                                                                                                                                                                                                                                                                                                   |
|                        |         | <p>▼ v1.19.25</p> <pre> ## Changes * Add final release 1.19.24 [ci skip] * Bump Ruby from 3.3.1 to 3.3.3 (#1730) * Bump Ruby from 3.3.1 to 3.3.4 (#1744) * Bump mysql from 8.0.36 to 8.0.39 (#1749) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |         | <ul style="list-style-type: none"> <li>* Fix resource name</li> <li>* Golang: Updated to v1.22.5. (#1737)</li> <li>* Revert "Revert increasing compilation VM size, it did not fix the mariadb problem" <ul style="list-style-type: none"> <li>* Revert increasing compilation VM size, it did not fix the mariadb problem</li> <li>* Unindent</li> <li>* Update bump mysql8 blob to prevent it from removing the mysql5 blob too</li> <li>* Update cf-d cloud config to use larger compilation VMs</li> </ul> </li> <li>## Dependencies <ul style="list-style-type: none"> <li>* **storage:** Updated to v1.43.0.<br/>For more information, see [storage] (<a href="https://github.com/googleapis/google-cloud-go">https://github.com/googleapis/google-cloud-go</a>).</li> <li>* **azblob:** Updated to v1.4.0.<br/>For more information, see [azblob] (<a href="https://github.com/Azure/azure-sdk-for-go">https://github.com/Azure/azure-sdk-for-go</a>).</li> <li>* **gomega:** Updated to v1.34.0.<br/>For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>).</li> <li>* **net:** Updated to v0.27.0.<br/>For more information, see [net] (<a href="https://github.com/golang/net">https://github.com/golang/net</a>).</li> <li>* **api:** Updated to v0.189.0.<br/>For more information, see [api] (<a href="https://github.com/googleapis/google-api-go-client">https://github.com/googleapis/google-api-go-client</a>).</li> <li>* **grpc:** Updated to v1.64.1.<br/>For more information, see [grpc] (<a href="https://github.com/grpc/grpc-go">https://github.com/grpc/grpc-go</a>).</li> </ul> </li> </ul> <p>▼ v1.19.24</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <pre>## Changes * Add final release 1.19.23 [ci skip]</pre> </div> |
| binary-offline-buildpack | 1.1.13  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| bpm                      | 1.3.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| capi                     | 1.189.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-autoscaling        | 250.3.1 | <p>▼ v250.3.1</p> <pre> ## What's Changed * Bump org.springframework.boot:spring-boot-gradle-plugin from 3.3.1 to 3.3.2 in /src/cf-autoscaling/api by @dependabot in https://github.com/pivotal-cf/cf-autoscaling-release/pull/986 * Pin github.com/vito/go-interact to v1.0.0 by @ctlong in https://github.com/pivotal-cf/cf-autoscaling-release/pull/987 * Bump github.com/onsi/ginkgo/v2 from 2.19.0 to 2.19.1 in /src by @dependabot in https://github.com/pivotal-cf/cf-autoscaling-release/pull/992 * Bump kotlinVersion from 1.9.24 to 1.9.25 in /src/cf-autoscaling/api by @dependabot in https://github.com/pivotal-cf/cf-autoscaling-release/pull/991 **Full Changelog**: https://github.com/pivotal-cf/cf-autoscaling-release/compare/v250.3.0...v250.3.1 </pre> |
| cf-cli                | 1.65.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cf-networking         | 3.47.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cflinuxfs3            | 0.391.0 | <p>▼ v0.391.0</p> <pre> This release ships with cflinuxfs3 version 0.391.0. For more information, see the [release notes](https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.391.0) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| cflinuxfs4            | 1.107.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub   | 2.12.86 | <p>▼ 2.12.86</p> <pre> ## What's Changed * Fixed DB migration failure issue with AWS RDS MySQL 5.7 (<a href="https://github.com/cloudfoundry/credhub/pull/770">https://github.com/cloudfoundry/credhub/pull/770</a>). * Various dependency bumps ## Note to users who have installed CredHub 2.12.67 - If you are upgrading to this version directly from CredHub 2.12.67 and if you are using MySQL with CredHub, manually execute the following SQL statements in your database before the upgrade:  ``` DROP TRIGGER IF EXISTS tr_credential_version_pre_del; DROP TRIGGER IF EXISTS tr_credential_version_post_del; DROP TRIGGER IF EXISTS tr_credential_pre_del; ```  **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.85...2.12.86">https://github.com/pivotal/credhub-release/compare/2.12.85...2.12.86</a> </pre> |
|           |         | <p>▼ 2.12.85</p> <pre> ## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.84...2.12.85">https://github.com/pivotal/credhub-release/compare/2.12.84...2.12.85</a> </pre> <p>▼ 2.12.84</p> <pre> ## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.83...2.12.84">https://github.com/pivotal/credhub-release/compare/2.12.83...2.12.84</a> </pre>                                                                                                                                                                                                                                                                                                                                                 |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.102.0 | <p>▼ v2.102.0</p> <pre> ## 2.102.0 **Release Date**: August 09, 2024 ## Changes - Add TLS support for tcp routes in route-emitter - Split metric_tags from run_info in desired LRP in BBS to minimize database queries issued by convergence ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_emitter/spec b/jobs/route_emitter/spec index 11dae3aec..df1b8383c 100644 --- a/jobs/route_emitter/spec +++ b/jobs/route_emitter/spec @@ -112,6 +112,9 @@ properties: tcp.enabled: description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API." default: false + tcp.enable_tls: +   description: "When enabled route-emitter will include TLS port and instance GUID when emitting TCP routes." +   default: false routing_api.url: description: "Routing API uri to be used by the tcp route-emitter" default: http://routing-api.service.cf.internal diff --git a/jobs/route_emitter_windows/spec b/jobs/route_emitter_windows/spec index cec39c995..9db9e8b69 100644 --- a/jobs/route_emitter_windows/spec +++ b/jobs/route_emitter_windows/spec @@ -112,6 +112,9 @@ properties: tcp.enabled: description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API." default: false + tcp.enable_tls: +   description: "When enabled route-emitter will include TLS port and instance GUID when emitting TCP routes." +   default: false routing_api.url: description: "Routing API uri to be used by the tcp route-emitter" default: http://routing-api.service.cf.internal ``` ## Built with go 1.22.6 **Full Changelog**: <a 865="" 900="" 952="" 965"="" data-label="Page-Footer" href="https://github.com/clou...&lt;/a&gt; &lt;/pre&gt; &lt;/td&gt;&lt;/tr&gt; &lt;/tbody&gt; &lt;/table&gt; &lt;/div&gt; &lt;div data-bbox=">563</a></pre> |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |         | <pre> dfoundry/diego-release/compare/v2.101.0...v2.102.0 ## Resources - [Download release 2.102.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.102.0).  ▼ v2.101.0  ## 2.101.0 **Release Date**: July 31, 2024 ## Changes - Adds the cnb-app-lifecycle package as a possible app lifecycle for diego. Thanks @pbuskov @nicolasbender @modulool1 for this huge effort! - Resolves an issue where CPUWeight could be set to 0 on a container. This value will now always be at least 1, complying with the spec. - Bumped golang to 1.22.5 - Bumped envoy to 1.28.4 - Various testing enhancements ## Bosh Job Spec changes: ```diff diff --git a/jobs/file_server/spec b/jobs/file_server/spec index dddda86c2..f530805b3 100644 --- a/jobs/file_server/spec +++ b/jobs/file_server/spec @@ -20,6 +20,7 @@ packages: - buildpack_app_lifecycle - docker_app_lifecycle - windows_app_lifecycle + - cnb_app_lifecycle provides: - name: file_server ``` ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.100.0...v2.101.0">https://github.com/cloudfoundry/diego-release/compare/v2.100.0...v2.101.0</a> ## Resources - [Download release 2.101.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.101.0). </pre> |
| dotnet-core-offline-buildpack | 2.4.31  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc                     | 1.54.0  | <p>▼ v1.54.0</p> <pre> ## 1.54.0 **Release Date**: July 31, 2024 ## Changes - Bump to golang 1.22.5 - Bump libnftnl to 1.2.8 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.53.0...v1.54.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.53.0...v1.54.0</a> ## Resources - [Download release 1.54.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.54.0). </pre>          |
| go-offline-buildpack            | 1.10.21 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| java-offline-buildpack          | 4.72.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| java-native-image-cnb-buildpack | 0.11.22 | <p>▼ 0.11.22</p> <pre> Components: * [buildpack v0.13.10] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.10">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.10</a>) </pre> <p>▼ 0.11.21</p> <pre> Components: * [buildpack v0.13.9] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.9">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.9</a>) </pre> |
| log-cache                       | 3.1.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| <b>Component</b>  | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator       | 107.0.16       | <p>▼ v107.0.16</p> <pre>## What's Changed * Bump packaged Golang to go1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.15...v107.0.16">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.15...v107.0.16</a></pre> <p>▼ v107.0.15</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 * Replace deprecated `grpc.Dial` with `grpc.NewClient` in <a href="https://github.com/cloudfoundry/loggregator-release/pull/745">https://github.com/cloudfoundry/loggregator-release/pull/745</a> * Fix race condition when starting server in test in <a href="https://github.com/cloudfoundry/loggregator-release/pull/746">https://github.com/cloudfoundry/loggregator-release/pull/746</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.14...v107.0.15">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.14...v107.0.15</a></pre> |
| loggregator-agent | 8.1.5          | <p>▼ v8.1.5</p> <pre>## What's Changed * Bump go dependencies</pre> <p>▼ v8.1.4</p> <pre>## What's Changed * Bump to Go1.22 by @aqstack in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/598">https://github.com/cloudfoundry/loggregator-agent-release/pull/598</a> * Bump go dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.3...v8.1.4">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.3...v8.1.4</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| mapfs             | 1.2.79         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| metric-registrar        | 4.0.2   | <p>▼ v4.0.2</p> <pre> ## What's Changed * Bump to Go1.22 by @aqstack in https://github.com/pivotal-cf/metric-registrar-release/pull/535 * Bump github.com/onsi/ginkgo/v2 from 2.17.1 to 2.19.0 in /src/tools by @dependabot in https://github.com/pivotal-cf/metric-registrar-release/pull/506 * Bump github.com/prometheus/client_golang from 1.19.0 to 1.19.1 in /src/tools by @dependabot in https://github.com/pivotal-cf/metric-registrar-release/pull/496 ## New Contributors * @aqstack made their first contribution in https://github.com/pivotal-cf/metric-registrar-release/pull/535 **Full Changelog**: https://github.com/pivotal-cf/metric-registrar-release/compare/v4.0.1...v4.0.2 </pre> |
| mysql-monitoring        | 10.15.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| nats                    | 56.22.0 | <p>▼ v56.22.0</p> <pre> ## 56.22.0 **Release Date**: July 29, 2024 ## Changes - dep: migrate to github.com/nats-io/nats.go (thx @maxmoehl) - Other dependency bumps ## Built with go 1.22.5 **Full Changelog**: https://github.com/cloudfoundry/nats-release/compare/v56.21.0...v56.22.0 ## Resources - [Download release 56.22.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.22.0). </pre>                                                                                                                                                                                                                                                                    |
| nfs-volume              | 7.1.75  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| nginx-offline-buildpack | 1.2.17  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.27  | <p>▼ 1.8.27</p> <pre> * Add node 22.5.0, remove node 22.4.1 (#74 8) for stack(s) cflinuxfs4 * Add node 18.20.4, remove node 18.20.2 for stack(s) cflinuxfs4, cflinuxfs3 * Add node 22.4.1 for stack(s) cflinuxfs4 * Add node 20.15.1, remove node 20.13.1 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    node   18.20.3   cflinuxfs3     node   18.20.3   cflinuxfs4     node   18.20.4   cflinuxfs3     node   18.20.4   cflinuxfs4     node   20.15.0   cflinuxfs3     node   20.15.0   cflinuxfs4     node   20.15.1   cflinuxfs3     node   20.15.1   cflinuxfs4     node   22.3.0   cflinuxfs4     node   22.5.0   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: 199bfb343ebd0e 96a115f8deb65b009459f3989a00993a523d0ef43fe2e 72e30 * Uncached buildpack SHA256: bc95e81186f5df 7f7a6aa320010383e55582489b6aad1a73922bac429e8 4d924 </pre> |
| notifications            | 72.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications-ui | 49.0.0  | <p>▼ v49.0.0</p> <pre> commit ddb72b9a5ba2d982a834d6f8433d7ddd5519 966b Author: PCF Event Alerts Team CI Date:   Wed Jul 24 03:41:28 2024 +0000 Cuts final release 49.0.0 [ci skip] commit 18956ac9e2a05f547586ca8198e4b786b3c8 8057 Merge: 80b5920 a7f3ef1 Author: Benjamin Fuller Date:   Tue Jul 23 14:03:00 2024 -0600 Merge pull request #26 from pivotal-cf/dependabot/go_modules/src/acceptance/github.com/PuerkitoBio/goquery-1.9.2 Bump github.com/PuerkitoBio/goquery from 1.8.1 to 1.9.2 in /src/acceptance commit a7f3ef1ac89a7cc2edb151935f87d69aaa8f 89f7 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Tue Jul 23 19:58:40 2024 +0000 Bump github.com/PuerkitoBio/goquery in /src/acceptance Bumps [github.com/PuerkitoBio/goquery] (https://github.com/PuerkitoBio/goquery) from 1.8.1 to 1.9.2. - [Release notes] (https://github.com/PuerkitoBio/goquery/releases) - [Commits] (https://github.com/PuerkitoBio/goquery/compare/v1.8.1...v1.9.2) --- updated-dependencies: - dependency-name: github.com/PuerkitoBio/goquery dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot] commit 80b592022034e173dc8443e2fa31b41e12e9 f5a3 Merge: a5cb2d6 7c02486 Author: Benjamin Fuller Date:   Tue Jul 23 13:56:48 2024 -0600 Merge pull request #29 from pivotal-cf/dependabot/go_modules/src/acceptance/github.com/onsi/ginkgo/v2-2.19.0 Bump github.com/onsi/ginkgo/v2 from 2.15.0 to 2.19.0 in /src/acceptance commit 7c024864fdf2f98ae0fea0e9570d06ab9ac3 20cd Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date:   Tue Jul 23 19:51:36 2024 +0000 Bump github.com/onsi/ginkgo/v2 from 2.15.0 to 2.19.0 in /src/acceptance </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>Bumps [github.com/onsi/ginkgo/v2] (https://github.com/onsi/ginkgo) from 2.15.0 to 2.19.0.</p> <ul style="list-style-type: none"> <li>- [Release notes] (https://github.com/onsi/ginkgo/releases)</li> <li>- [Changelog] (https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md)</li> <li>- [Commits] (https://github.com/onsi/ginkgo/compare/v2.15.0...v2.19.0)</li> </ul> <p>---</p> <p>updated-dependencies:</p> <ul style="list-style-type: none"> <li>- dependency-name: github.com/onsi/ginkgo/v2</li> </ul> <p>dependency-type: direct:production<br/>update-type: version-update:semver-minor<br/>...</p> <p>Signed-off-by: dependabot[bot]</p> <p>commit a5cb2d65ad67272251438fb13f46faf17c80f6c0</p> <p>Merge: 4e6d0d8 fd9c39e<br/>Author: Benjamin Fuller<br/>Date: Tue Jul 23 13:50:50 2024 -0600<br/>Merge pull request #23 from pivotal-cf/dependabot/go_modules/src/acceptance/golang.org/x/net-0.23.0<br/>Bump golang.org/x/net from 0.19.0 to 0.23.0 in /src/acceptance<br/>commit fd9c39eef1c40173f567303784f7d0764ff187a0<br/>Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt;<br/>Date: Tue Jul 23 19:50:40 2024 +0000<br/>Bump golang.org/x/net from 0.19.0 to 0.23.0 in /src/acceptance<br/>Bumps [golang.org/x/net] (https://github.com/golang/net) from 0.19.0 to 0.23.0.<br/>- [Commits] (https://github.com/golang/net/compare/v0.19.0...v0.23.0)</p> <p>---</p> <p>updated-dependencies:</p> <ul style="list-style-type: none"> <li>- dependency-name: golang.org/x/net</li> </ul> <p>dependency-type: indirect<br/>...</p> <p>Signed-off-by: dependabot[bot]</p> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| otel-collector        | 0.7.0   | <p>▼ v0.7.0</p> <pre>## What's Changed * feat: Add memory limits by @aqstack in https://github.com/cloudfoundry/otel-collector-release/pull/43   **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.2...v0.7.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.2...v0.7.0</a></pre> <p>▼ v0.6.2</p> <pre>## What's Changed * Config to allow subset of processors and exporters by @oppegard in https://github.com/cloudfoundry/otel-collector-release/pull/40   **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.1...v0.6.2">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.1...v0.6.2</a></pre> <p>▼ v0.6.1</p> <pre>## What's Changed * Move config.yaml and update scripting by @oppegard in https://github.com/cloudfoundry/otel-collector-release/pull/37   * chore: Bump to Go1.22 by @aqstack in https://github.com/cloudfoundry/otel-collector-release/pull/38     ## New Contributors     * @oppegard made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/37     * @aqstack made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/38       **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.0...v0.6.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.0...v0.6.1</a></pre> |
| php-offline-buildpack | 4.6.22  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| <b>Component</b>          | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release | 677.0.53       | <p>▼ 677.0.53</p> <ul style="list-style-type: none"> <li>* Rebrand apps-manager. Update stylings to fit new branding.</li> </ul> <p>▼ 677.0.52</p> <ul style="list-style-type: none"> <li>* fix scheduler job form to allow editing resource limits correctly</li> </ul> <p>▼ 677.0.51</p> <ul style="list-style-type: none"> <li>## What's Changed <ul style="list-style-type: none"> <li>* appsman should not break when spring git path ends up null in external route helper</li> </ul> </li> </ul> <p>▼ 677.0.50</p> <ul style="list-style-type: none"> <li>* update dependencies</li> </ul> |
| push-offline-docs-release | 6.0.169        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.119 | <p>▼ v674.0.119</p> <pre>## Changes * creating final release 674.0.118</pre> <p>▼ v674.0.118</p> <pre>## Changes * creating final release 674.0.117 ## Dependencies * **app-usage-service:** Updated to v`52e9a 57` . For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> <p>▼ v674.0.117</p> <pre>## Changes * creating final release 674.0.116</pre> <p>▼ v674.0.116</p> <pre>## Changes * creating final release 674.0.114 * moving to tpe ## Dependencies * **app-usage-service:** Updated to v`115c9 33` . For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> |
| pxc                        | 1.0.30    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| python-offline-buildpack   | 1.8.27    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| r-offline-buildpack | 1.2.13  | <p>▼ 1.2.13</p> <pre>* Add r 4.4.1 for stack(s) cflinuxfs3, cflinuxfs4 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.8.1.1 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.8.1.1 [#187828151] * Rebuild r 4.3.3 for stack(s) cflinuxfs4, cflinuxfs3 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.8.1.1 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.8.1.1 * Rebuild r 4.2.3 for stack(s) cflinuxfs3, cflinuxfs4 with dependencies for stack cflinuxfs3: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.8.1.1 with dependencies for stack cflinuxfs4: for ecast 8.23.0, plumber 1.2.2, rserve 1.8.13, s hiny 1.8.1.1 [#187828149] * Remove 4.4.0 to keep buildpack under 1GB   name   version   cf_stacks   modules    - - -    r   4.2.3   cflinuxfs3   forecast, plumbe r, rserve, shiny     r   4.2.3   cflinuxfs4   forecast, plumbe r, rserve, shiny     r   4.3.3   cflinuxfs3   forecast, plumbe r, rserve, shiny     r   4.3.3   cflinuxfs4   forecast, plumbe r, rserve, shiny     r   4.4.1   cflinuxfs3   forecast, plumbe r, rserve, shiny     r   4.4.1   cflinuxfs4   forecast, plumbe r, rserve, shiny   * Uncached buildpack SHA256: 419d110914dc53 c0b9e332f31faf80ee0eef5e088593e720fb4b441a955 4b043 * Uncached buildpack SHA256: c1beccbe15aae6 e9d2574b442c73019f98dc6a7e381ab6f8db052c53d71 f4bc9</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.304.0 | <p>▼ v0.304.0</p> <pre> ## 0.304.0 **Release Date**: August 13, 2024 ## Changes - Addresses issues with routing-api DB migration logic to fix the following bugs:   - Failed DB migrations would not re-run without manual intervention in the database   - DB migrations could run prior to the active routing-api server receiving code updates   - Failed DB migrations did not result in BOSH deployment failures   - Works around an issue with Gorm + the V6 schema changes for TLS TCP Routing that did not always get applied properly. ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.303.0...v0.304.0">https://github.com/cloudfoundry/routing-release/compare/v0.303.0...v0.304.0</a> ## Resources - [Download release 0.304.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.304.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.304.0</a>). </pre> <p>▼ v0.303.0</p> <pre> ## 0.303.0 **Release Date**: August 09, 2024 ## Changes * add additional unsafe params by @pnikonorov in <a href="https://github.com/cloudfoundry/routing-release/pull/431">https://github.com/cloudfoundry/routing-release/pull/431</a> ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index de81a0e8..feafaf10 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -132,10 +132,16 @@ properties:   name (required, string): Human-readable reference for the healthcheck   script_path (required, string): Path to script that will be run periodically to determine     service health   + unrestricted_volumes (optional, array of unrestricted_volumes): Additional directories to be mounted in the bpm config for the route_registrar job.   + privileged: (optional, boolean): Sets bpm privileged flag. defaults to false   timeout (optional, string): The healthcheck script must exit within this timeout, otherwise ``` </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> se the script is terminated with `SIGKILL` and the route is unregistered. Value is a string (e.g. "10s") and must parse to a positive tim e duration i.e. "-5s" is not permitted. Must be less than the value of `registration_inter val`.  Default: Half of the value of `registration _interval` +      unrestricted_volume object +      path (required, string): the path to be mounted +      writable (optional, boolean): sets the writable flag. defaults to false + options object lb_algo (optional, string): Load balancing algorithm for routing incoming requests to th e backend: 'round-robin' or 'least-connectio n'. In cases where this option is not specifi ed, the algorithm defined in gorouter spec is applied.  ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.302.0...v0.303.0">https://github.com/cloudfoundry/routing-release/compare/v0.302.0...v0.303.0</a> </pre> |

#### ▼ v0.302.0

```

## 0.302.0
**Release Date**: August 08, 2024
## Changes
- Adds drain_wait + load_balancer_healthy_
threshold properties behaving similarly to go
router's to provide better uptime during BOSH
deployments by waiting for LBs to pull nodes
about to be shut down out of service, and re-
add them before moving on to the next.
- Adds support for TLS backends with TCP r
outes. This enables TCP routes to use the env
oy proxy settings on app containers used by H
TTP routes, providing guaranteed TLS encrypti
on between tcp-router + diego-cell VMs, witho
ut intervention from app teams. Additionally
it allows for the disabling of the unproxied
ports on containers since TCP route traffic c
an now go through envoy.
- Fixed a bug with v0.301.0 that caused pr
oblems with TCP routes when a postgres databa
se was used for the routing-api. Thanks for
[finding this](https://github.com/cloudfoundry/routing-api/issues/57) @schmidtsv!
- Bumped to golang 1.22.5
- Bumped tcp_router's haproxy to 2.8.10
- Testing + docs improvements
## Bosh Job Spec changes:

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ```diff diff --git a/jobs/tcp_router/spec b/jobs/tcp_router/spec index 44fbb41a..aa6b764c 100644 --- a/jobs/tcp_router/spec +++ b/jobs/tcp_router/spec @@ -10,10 +10,16 @@ templates:     routing_api_client_certificate.crt.erb: config/certs/routing-api/client.crt     routing_api_client_private.key.erb: config/keys/routing-api/client.key     routing_api_ca_certificate.crt.erb: config/certs/routing-api/ca_cert.crt     + tcp_router_backend_client_cert_and_key.pem.erb: config/keys/tcp-router/backend/client_cert_and_key.pem     + tcp_router_backend_ca.crt.erb: config/creds/tcp-router/backend/ca.crt     tcp_router_health_check_certificate.pem.erb: config/certs/health.pem     + # config/haproxy.conf is used for initial haproxy config when starting up       haproxy.conf.erb: config/haproxy.conf     - haproxy.conf.template.erb: config/haproxy.conf.template     + # config/haproxy.conf.template is rendered by tcp-router when routes are provided       haproxy.conf.template.erb: config/haproxy.conf.template     bpm.yml.erb: config/bpm.yml     + drain.erb: bin/drain     + post-start.erb: bin/post-start       packages:     - routing_utils @@ -46,6 +52,18 @@ properties:     default: "1m"     tcp_router.oauth_secret:       description: "OAuth client secret used to obtain token for Routing API from UAA."     + tcp_router.backend_tls.enabled:       + description:           + Turns on support for TLS for TCP Router. Requires tcp_router.backend_tls.ca_cert to         + be set. For mTLS also set tcp_router.backend_tls.client_cert and         + tcp_router.backend_tls.client_key.       + default: false       + tcp_router.backend_tls.client_cert:         + description: "TCP Router's TLS client cert used for mTLS with route backends"       + tcp_router.backend_tls.client_key:         + description: "TCP Router's TLS client private key used for mTLS with route backends"       + tcp_router.backend_tls.ca_cert:         + description: "TCP Router's TLS CA used </pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |         | <pre> with route backends"   routing_api.uri:     description: "URL where the routing API can be reached internally" @@ -86,6 +104,19 @@ properties:   description: "Fail the tcp router if routin g_api.reserved_system_component_ports conflic t with ports in existing router groups."   default: "false" +  tcp_router.drain_wait: +    description:         +      Delay in seconds after shut down is initiated before haproxy stops listening.       +      During this time haproxy will reject requests to the /health endpoint.       +      This accommodates requests forwarded by a load balancer until it considers the tcp _router unhealthy.       +      default: 20 +  tcp_router.load_balancer_healthy_threshold: +    description:         +      Time period in seconds to wait until declaring the tcp_router instance       +      started after starting the listener socket. This allows an external load       +      balancer time to register the instan ce as healthy."       +      default: 20 +   uaa.token_endpoint:     description: "UAA token endpoint host name. Do not include a scheme in this value; TCP Ro uter will always use TLS to connect to UAA."     default: uaa.service.cf.internal ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.301.0...v0.302.0">https://github.com/cloudfoundry/routing-release/compare/v0.301.0...v0.302.0</a> ## Resources - [Download release 0.302.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.302.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.302.0</a>). </pre> |
| ruby-offline-buildpack | 1.10.17 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| web-servers-cnb-buildpack    | 0.15.2  | <p>▼ 0.15.2</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.18.1] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.18.1">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.18.1</a>)</li> </ul> </div> <p>▼ 0.15.1</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.18.0] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.18.0">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.18.0</a>)</li> </ul> </div> |
| silk                         | 3.47.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| smb-volume                   | 3.1.74  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| staticfile-offline-buildpack | 1.6.15  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| statsd-injector              | 1.11.42 | <p>▼ v1.11.42</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * chore: Bump to Go1.22 by @aqstack in https://github.com/cloudfoundry/statsd-injector-release/pull/166 ## New Contributors * @aqstack made their first contribution in https://github.com/cloudfoundry/statsd-injector-release/pull/166 **Full Changelog**: <a href="https://github.com/cloudfoundry/statsd-injector-release/compare/v1.11.41...v1.11.42">https://github.com/cloudfoundry/statsd-injector-release/compare/v1.11.41...v1.11.42</a></pre> </div>                                                                                                                                     |
| syslog                       | 12.3.1  | <p>▼ v12.3.1</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Bump packaged Golang to go1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.0...v12.3.1">https://github.com/cloudfoundry/syslog-release/compare/v12.3.0...v12.3.1</a></pre> </div>                                                                                                                                                                                                                                                                                                                                                                  |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| system-metrics-scraper | 4.0.10  | <p>▼ v4.0.10</p> <pre>## What's Changed * Bump to Go1.22 by @aqstack in https://github.com/cloudfoundry/system-metrics-scraper-release/pull/248 ## New Contributors * @aqstack made their first contribution in https://github.com/cloudfoundry/system-metrics-scraper-release/pull/248 **Full Changelog**: https://github.com/cloudfoundry/system-metrics-scraper-release/comparerelease/v4.0.9...v4.0.10</pre> |
| uaa                    | 77.14.0 |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| tanzu-jammy-stack      | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 6.0.6

**Release Date:** 07/29/2024



### Caution

This release is affected by a known issue for customers who use both Postgres for the TAS for VMs database and TCP Routes. Users who use both Postgres and TCP Routes should not upgrade to this version. This only applies if Postgres is used for the core Cloud Foundry databases, not if apps use Postgres services.

- **[Bug Fix]** Fixes a regression where pushing docker apps with SHA256 digests fails
- **[Bug Fix]** Resolves a rare issue leading to pre-start script failures in the garden-cni + vxlan-policy-agent jobs on diego-cells
- **[Bug Fix]** Scaling factors should be declarative in the autoscaler manifest
- **[Bug Fix]** Accept null body for SLC PUT API
- **[Bug Fix]** Adds 2 minute caching for failed dns lookups in syslog agent to avoid dns load for malformed drain urls.
- **[Feature]** Adds `PrometheusRemoteWrite` exporter and `batch` processor.
- Bump backup-and-restore-sdk to version `1.19.23`
- Bump binary-offline-buildpack to version `1.1.13`
- Bump bpm to version `1.2.23`
- Bump capi to version `1.187.0`
- Bump cf-autoscaling to version `250.3.0`
- Bump cf-cli to version `1.65.0`

- Bump cf-networking to version 3.47.0
- Bump cflinuxfs4 to version 1.107.0
- Bump credhub to version 2.12.83
- Bump dotnet-core-offline-buildpack to version 2.4.31
- Bump go-offline-buildpack to version 1.10.21
- Bump java-native-image-cnb-buildpack to version 0.11.20
- Bump log-cache to version 3.1.1
- Bump loggregator-agent to version 8.1.3
- Bump metric-registrar to version 4.0.1
- Bump nfs-volume to version 7.1.75
- Bump nginx-offline-buildpack to version 1.2.17
- Bump nodejs-offline-buildpack to version 1.8.26
- Bump notifications to version 72.0.0
- Bump notifications-ui to version 48.0.0
- Bump otel-collector to version 0.6.0
- Bump php-offline-buildpack to version 4.6.22
- Bump push-apps-manager-release to version 677.0.49
- Bump push-usage-service-release to version 674.0.114
- Bump pxc to version 1.0.30
- Bump python-offline-buildpack to version 1.8.27
- Bump ruby-offline-buildpack to version 1.10.17
- Bump web-servers-cnb-buildpack to version 0.15.0
- Bump silk to version 3.47.0
- Bump smb-volume to version 3.1.74
- Bump staticfile-offline-buildpack to version 1.6.15
- Bump statsd-injector to version 1.11.41
- Bump system-metrics-scraper to version 4.0.9
- Bump uaa to version 77.14.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.486   |               |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk   | 1.19.23 | <p>▼ v1.19.23</p> <pre> ## Changes * Add final release 1.19.22 [ci skip] * Update db.t2.micro to db.t3.micro in terraform template ## Dependencies * **bosh-backup-and-restore:** Updated to v1.9.66. For more information, see [bosh-backup-and-restore](https://github.com/cloudfoundry-incubator/bosh-backup-and-restore). * **api:** Updated to v0.186.0. For more information, see [api](https://github.com/googleapis/google-api-go-client). </pre>                                                                                                                                                                                                                            |
| binary-offline-buildpack | 1.1.13  | <p>▼ 1.1.13</p> <pre> * remove references to the windows2016 stack This stack is identical to the windows stack and windows2016 has been unsupported in CF for a long time now. <a href="https://docs.cloudfoundry.org/devguide/deploy-apps/windows-stacks.html#available-stacks">https://docs.cloudfoundry.org/devguide/deploy-apps/windows-stacks.html#available-stacks</a> * Uncached buildpack SHA256: 9fb3f39c29fdaf c91d74e892536d379d333dc33c2f827e3ff49a3141994 bd134 * Uncached buildpack SHA256: e37cce5b94edc9 72235855d1c75243424c264e465a161dee9bc9a56795e 35407 * Uncached buildpack SHA256: b99281c12b704f 8fdd581df76e4d850bd3729ba87221f53594332cc7436 f2634 </pre> |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| bpm                      | 1.2.23  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| capi                     | 1.187.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-autoscaling | 250.3.0 | <p>▼ v250.3.0</p> <pre> ## What's Changed * Feature: Add per-app cooldown period by @ctlong in https://github.com/pivotal-cf/cf-autoscaling-release/pull/961 * Bug: Scaling factors should be declarative in the autoscaler manifest by @aqstack in https://github.com/pivotal-cf/cf-autoscaling-release/pull/973 * Bug: Accept null body for SLC PUT API by @acostall in https://github.com/pivotal-cf/cf-autoscaling-release/pull/978 * Chore: Use `cf enable-service-access` in `deploy-autoscaler` by @ctlong in https://github.com/pivotal-cf/cf-autoscaling-release/pull/966 * Bump packaged Golang to 1.22.5 by @aqstack in https://github.com/pivotal-cf/cf-autoscaling-release/pull/975 * Bump dependencies ## New Contributors * @oppegard made their first contribution in https://github.com/pivotal-cf/cf-autoscaling-release/pull/967 * @aqstack made their first contribution in https://github.com/pivotal-cf/cf-autoscaling-release/pull/973 * @acostall made their first contribution in https://github.com/pivotal-cf/cf-autoscaling-release/pull/978 **Full Changelog**: https://github.com/pivotal-cf/cf-autoscaling-release/compare/v250.2.5...v250.3.0 </pre> |
| cf-cli         | 1.65.0  | <p>▼ v1.65.0</p> <pre> ### Included CF CLI versions: 7.7.11 8.7.11 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking    | 3.47.0         | <p>▼ v3.47.0</p> <pre> ## 3.47.0 **Release Date**: July 19, 2024 ## Changes - Fixed a bug in the pre-start script of g arden-cni that deleted the iptables.lock file + directory unnecessarily, causing issues wit h the vxlan-policy-agent pre-start script - Refactored polling logic in policy-server - Bump to go 1.22.5 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/clou dfoundry/cf-networking-release/compare/v3.46. 0...v3.47.0">https://github.com/cloudfoundr y/cf-networking-release/compare/v3.46. 0...v3.47.0</a> ## Resources - [Download release 3.47.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/cf-networking-release?version=3.47.0). </pre> |
| cflinuxfs3       | 0.390.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4            | 1.107.0 | <p>▼ v1.107.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.107.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.107.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.107.0</a>)</p></div> <p>▼ v1.106.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.106.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.106.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.106.0</a>)</p></div> <p>▼ v1.105.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.105.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.105.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.105.0</a>)</p></div> <p>▼ v1.104.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.104.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.104.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.104.0</a>)</p></div> |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub   | 2.12.83 | <p>▼ 2.12.83</p> <pre>## What's Changed * Build(deps): Bump parser from 3.3.3.0 to 3.3.4.0 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/223 * Build(deps): Bump rubocop from 1.64.1 to 1.65.0 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/224 * Build(deps): Bump rexml from 3.3.1 to 3.3.2 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/225 **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.82...2.12.83">https://github.com/pivotal/credhub-release/compare/2.12.82...2.12.83</a></pre> <p>▼ 2.12.82</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.81...2.12.82">https://github.com/pivotal/credhub-release/compare/2.12.81...2.12.82</a></pre> <p>▼ 2.12.81</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.80...2.12.81">https://github.com/pivotal/credhub-release/compare/2.12.80...2.12.81</a></pre> |
| diego     | 2.100.0 | 2.100.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.31  | <p>▼ 2.4.31</p> <pre> * Add node 20.15.1, remove node 20.15.0 for stack(s) cflinuxfs3, cflinuxfs4 * Add dotnet-sdk 6.0.424, remove dotnet-sdk 6.0.423 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 6.0.32, remove dotn et-aspnetcore 6.0.31 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 6.0.32, remove dotnet- runtime 6.0.31 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 8.0.7, remove dotnet-r untime 8.0.6 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 8.0.303, remove dotnet-sdk 8.0.302 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 8.0.7, remove dotne t-aspnetcore 8.0.6 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 8.0.302, remove dotnet-sdk 8.0.301 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187774625">https://www.pivotaltracker.com/story/show/187774625</a>) * Add node 20.15.0, remove node 20.14.0 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187832044">https://www.pivotaltracker.com/story/show/187832044</a>)   name   version   cf_stacks    - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.32   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.7   cflinuxfs3, c flinuxfs4     dotnet-runtime   6.0.32   cflinuxfs3, cfli nuxfs4     dotnet-runtime   8.0.7   cflinuxfs3, cfli nuxfs4     dotnet-sdk   6.0.424   cflinuxfs3, cfli nuxfs4     dotnet-sdk   8.0.303   cflinuxfs3, cfli nuxfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.15.1   cflinuxfs3     node   20.15.1   cflinuxfs4   Default binary versions:   name   version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x   </pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |         | <pre>  dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: a23d536c6a1aef aa97b743a1be8686fe924d4a422baf7f9cb5897ad8405 0be96 * Uncached buildpack SHA256: 6cecfb9c1faac8 ff37d5d0d34430eb5e489ef6a6d92c1e05e9ae3107b81 0eb6a</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| garden-runc            | 1.53.0  | <a href="#">1.53.0</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| go-offline-buildpack   | 1.10.21 | <p>▼ 1.10.21</p> <pre>* Add go 1.22.5, remove go 1.22.4 for stack(s) cflinuxfs3, cflinuxfs4 * Add go 1.21.12, remove go 1.21.11 for stack(s) cflinuxfs3, cflinuxfs4 * Add go 1.21.11, remove go 1.21.10 for stack(s) cflinuxfs3, cflinuxfs4 (<a href="https://www.pivotaltracker.com/story/show/187736425">https://www.pivotaltracker.com/story/show/187736425</a>) * Add go 1.22.4, remove go 1.22.3 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187736484">https://www.pivotaltracker.com/story/show/187736484</a>)   name   version   cf_stacks    - - -   dep   0.5.4   cflinuxfs3     dep   0.5.4   cflinuxfs4     glide   0.13.3   cflinuxfs3     glide   0.13.3   cflinuxfs4     go   1.21.12   cflinuxfs3     go   1.21.12   cflinuxfs4     go   1.22.5   cflinuxfs3     go   1.22.5   cflinuxfs4     godep   80   cflinuxfs3     godep   80   cflinuxfs4   Default binary versions:   name   version    - -    go   1.21.x   * Uncached buildpack SHA256: aaef311f5db1fc 66e95e0aa92b9537c0110c2bd4b41b0c26ca99b551bca 95dc6 * Uncached buildpack SHA256: cb5b1363b50d1a b24331b7418701ba32591d90be9849caf1f2e6eb124cf6 7df11</pre> |
| java-offline-buildpack | 4.72.0  | <a href="#">Java Buildpack v4.72.0</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component                       | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-native-image-cnb-buildpack | 0.11.20  | <p>▼ 0.11.20</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.9] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.9">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.9</a>)</li> </ul> </div> <p>▼ 0.11.19</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.8] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.8">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.8</a>)</li> </ul> </div>                                                                                                                                                                                                                                           |
| log-cache                       | 3.1.1    | <p>▼ v3.1.1</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.1.0...v3.1.1">https://github.com/cloudfoundry/log-cache-release/compare/v3.1.0...v3.1.1</a></pre> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| loggregator                     | 107.0.14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| loggregator-agent               | 8.1.3    | <p>▼ v8.1.3</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Cache failed dns lookups for 120 seconds which reduced load on DNS system when invalid drains are present by @acostall in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/596">https://github.com/cloudfoundry/loggregator-agent-release/pull/596</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.2...v8.1.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.2...v8.1.3</a></pre> </div> <p>▼ v8.1.2</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.1...v8.1.2">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.1...v8.1.2</a></pre> </div> |
| mapfs                           | 1.2.79   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                        |
|------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| metric-registrar | 4.0.1   | <p>▼ v4.0.1</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: <a href="https://github.com/pivotal-cf/metric-registrar-release/compare/v4.0.0...v4.0.1">https://github.com/pivotal-cf/metric-registrar-release/compare/v4.0.0...v4.0.1</a></pre> |
| mysql-monitoring | 10.15.0 |                                                                                                                                                                                                                                                                                                      |
| nats             | 56.21.0 |                                                                                                                                                                                                                                                                                                      |
| nfs-volume       | 7.1.75  | <p>▼ v7.1.75</p> <pre>## Changes ## Dependencies * **nfsv3driver:** Updated to v`44424a7` . For more information, see [nfsv3driver] (<a href="https://github.com/cloudfoundry/nfsv3driver">https://github.com/cloudfoundry/nfsv3driver</a>) .</pre>                                                  |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack | 1.2.17  | <p>▼ 1.2.17</p> <pre> * Add openresty 1.21.4.3, remove openresty   1.21.4.2   for stack(s) cflinuxfs3, cflinuxfs4 * Add nginx 1.27.0, remove nginx 1.25.5   for stack(s) cflinuxfs4, cflinuxfs3   (<a href="https://www.pivotaltracker.com/story/show/187862902">https://www.pivotaltracker.com/story/show/187862902</a>) * Update nginx default version to 1.27   name   version   cf_stacks    - - -   nginx   1.26.1   cflinuxfs3     nginx   1.26.1   cflinuxfs4     nginx   1.27.0   cflinuxfs3     nginx   1.27.0   cflinuxfs4     openresty   1.21.4.3   cflinuxfs3     openresty   1.21.4.3   cflinuxfs4     openresty   1.25.3.1   cflinuxfs3     openresty   1.25.3.1   cflinuxfs4   Default binary versions:   name   version    - -    nginx   1.27.x   * Uncached buildpack SHA256: e10a05e9bc709f 387b0148dd1a5de10ae4a955e9e79332d59cd096ac57a c363b * Uncached buildpack SHA256: 16e4e6709718db 4c54dc8fde674fb9b6b4bb95d895fad2b6228bb53bb34 545f1 </pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.26  | <p>▼ 1.8.26</p> <pre>* Add node 20.15.0, remove node 20.12.0 for stack(s) cflinuxfs4, cflinuxfs3 * Add node 22.3.0 for stack(s) cflinuxfs4   name   version   cf_stacks    - -    node   18.20.2   cflinuxfs3     node   18.20.2   cflinuxfs4     node   18.20.3   cflinuxfs3     node   18.20.3   cflinuxfs4     node   20.13.1   cflinuxfs3     node   20.13.1   cflinuxfs4     node   20.15.0   cflinuxfs3     node   20.15.0   cflinuxfs4     node   22.3.0   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: 3d33753e0a1797 26e868054948fee0de796ec8c6b67cd0001515f880254 f0c83 * Uncached buildpack SHA256: bc6c2d4520a395 f44c3abf0c6be7b934722803b7b30d8e4180a60f90bfe 8cd93</pre> |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications | 72.0.0  | <p>▼ v72.0.0</p> <pre> commit f96419745b30a9763ebdf969fd7341b5d7fb f689 Author: PCF Toronto Concourse CI Bot Date:   Fri Jul 19 03:54:31 2024 +0000 Cuts final release 72.0.0 [ci skip] commit 0e1db9415eec7d8ab36951d4b63991baa1cf a400 Author: PCF Event Alerts Team CI Date:   Thu Jul 18 19:15:42 2024 +0000 Bump submodule src/notifications </pre> <p>▼ v71.0.0</p> <pre> commit a14a3932d435d8c92455d4c1991d6af15b2b 0afc Author: PCF Toronto Concourse CI Bot Date:   Fri Jul 5 16:03:51 2024 +0000 Cuts final release 71.0.0 [ci skip] commit c8eaf489d7ba205808d42a0d3624ede02e6a d3a4 Author: PCF Event Alerts Team CI Date:   Fri Jul 5 15:26:23 2024 +0000 Bump submodule src/notifications commit 252b0c31b17438ddb3f2911195c8997ec1b1 e2a0 Author: PCF Event Alerts Team CI Date:   Fri Jul 5 15:24:35 2024 +0000 Bump submodule src/notifications commit 3e500fcf33d1f9a0a633180ca976a5b114f0 d0e0 Author: PCF Event Alerts Team CI Date:   Wed Jul 3 17:56:02 2024 +0000 bump-golang to v0.154.0 commit 59d4a426372c62fd7ff535c1254bcb7c103e f796 Author: PCF Event Alerts Team CI Date:   Thu Apr 18 16:55:58 2024 +0000 Bump submodule src/notifications commit 4ee8a90214c87e89eb31402d68a970f90417 5d57 Author: PCF Event Alerts Team CI Date:   Thu Apr 18 16:52:05 2024 +0000 Bump submodule src/notifications commit 3e59690ef9371294e863935ec8893dce261b af4a Merge: 248d282 5b00c34 Author: Benjamin Fuller Date:   Thu Apr 18 10:38:19 2024 -0600 Merge pull request #54 from cloudfoundry/de pendabot/go_modules/src/acceptance/github.co m/onsi/ginkgo/v2-2.17.1 Bump github.com/onsi/ginkgo/v2 from 2.15.0 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> to 2.17.1 in /src/acceptance commit 5b00c341f0b9cb44e836d254a8a0a4feedb4 f153 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date: Thu Apr 18 16:38:12 2024 +0000 Bump github.com/onsi/ginkgo/v2 from 2.15.0 to 2.17.1 in /src/acceptance Bumps [github.com/onsi/ginkgo/v2](https://github.com/onsi/ginkgo) from 2.15.0 to 2.17.1. - [Release notes](https://github.com/onsi/ginkgo/releases) - [Changelog](https://github.com/onsi/ginkgo/blob/master/CHANGELOG.md) - [Commits](https://github.com/onsi/ginkgo/compare/v2.15.0...v2.17.1) --- updated-dependencies: - dependency-name: github.com/onsi/ginkgo/v2 dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot] commit 248d282c87f2db1915aaa0ef49a959ac3ea0 d196 Merge: 45d3f2c 0c9f6aa Author: Benjamin Fuller Date: Thu Apr 18 10:37:24 2024 -0600 Merge pull request #53 from cloudfoundry/dependabot/go_modules/src/acceptance/github.com/onsi/gomega-1.32.0 Bump github.com/onsi/gomega from 1.31.1 to 1.32.0 in /src/acceptance commit 0c9f6aaa621d30f50346341bf387026814da 0a53 Author: dependabot[bot] &lt;49699333+dependabot[bot]@users.noreply.github.com&gt; Date: Mon Mar 18 22:09:11 2024 +0000 Bump github.com/onsi/gomega from 1.31.1 to 1.32.0 in /src/acceptance Bumps [github.com/onsi/gomega](https://github.com/onsi/gomega) from 1.31.1 to 1.32.0. - [Release notes](https://github.com/onsi/gomega/releases) - [Changelog](https://github.com/onsi/gomega/blob/master/CHANGELOG.md) - [Commits](https://github.com/onsi/gomega/compare/v1.31.1...v1.32.0) --- updated-dependencies: - dependency-name: github.com/onsi/gomega dependency-type: direct:production update-type: version-update:semver-minor ... Signed-off-by: dependabot[bot]</pre> |

| Component | Version | Release Notes |
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| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications-ui | 48.0.0  | <p>▼ v48.0.0</p> <pre> commit 4e6d0d87ba374a545942f2875b93b564ab79 e844 Author: PCF Event Alerts Team CI Date:   Fri Jul 5 16:06:00 2024 +0000 Cuts final release 48.0.0 [ci skip] commit 89b112ba44b98d2bc0fa81d2af25f05c974c 5e20 Author: PCF Event Alerts Team CI Date:   Fri Jul 5 15:25:37 2024 +0000 Bump submodule src/notifications-ui commit 1e4fb443b8bdb214b410d0d34f2041febfb3 b695 Author: PCF Event Alerts Team CI Date:   Fri Jul 5 15:23:51 2024 +0000 Bump submodule src/notifications-ui commit f6337dc476bd00a4ef5a0ca77dfdb0967df1 c6d0 Author: PCF Event Alerts Team CI Date:   Wed Jul 3 17:56:18 2024 +0000 Bump submodule src/notifications-ui commit 4a65c75f41368d90c5416e3952e2a2c4bc95 2bb6 Author: PCF Event Alerts Team CI Date:   Tue Jul 2 20:07:02 2024 +0000 bump-golang to v0.154.0 commit b9a1eef87cc0b7c97766e7aa2ebc451a2773 c8d6 Author: PCF Event Alerts Team CI Date:   Tue Jun 4 18:53:05 2024 +0000 bump-golang to v0.151.0 commit 5502aaflc08695f15809f13725e9eealf18e 60b0 Author: PCF Event Alerts Team CI Date:   Tue May 7 17:11:53 2024 +0000 bump-golang to v0.150.0 commit 067a70cc6dc8b11fb3970866b1e61d5e25d1 cf08 Author: PCF Event Alerts Team CI Date:   Thu Apr 18 20:35:25 2024 +0000 Bump submodule src/notifications-ui commit 5ddf8d1e86c4a877f8dbde00bb8af4bce0fc 675d Author: PCF Event Alerts Team CI Date:   Thu Apr 18 16:46:55 2024 +0000 Bump submodule src/notifications-ui commit 51729f5cf10e9c61b8b4e99a77d09ac7d072 d0f3 Author: PCF Event Alerts Team CI Date:   Wed Apr 3 16:25:10 2024 +0000 bump-golang to v0.148.0 commit cd313ae73dd20ddfab754a36c19b0ce0dda a4b6 Author: PCF Event Alerts Team CI Date:   Tue Mar 5 18:25:15 2024 +0000 </pre> |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |         | <pre>bump-golang to v0.147.0 commit 8d006aa3ff995c251f5574eba36f2f1321b3 67dd Author: PCF Event Alerts Team CI Date:   Wed Feb 7 19:16:14 2024 +0000 bump-golang to v0.146.0 commit 927a01497cd1903567c2396ba5846c86f55e 8fff Author: PCF Event Alerts Team CI Date:   Tue Feb 6 19:22:55 2024 +0000 bump-golang to v0.144.0</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| otel-collector | 0.6.0   | <p>▼ v0.6.0</p> <pre>## What's Changed * Expose wider collector configuration by @acrmp in https://github.com/cloudfoundry/otel-collector-release/pull/31. This allows for configuring processors, pipelines &amp; exporters which provides a lot more flexibility to platform engineers. * Add PrometheusRemoteWrite Exporter by @benjaminguettmann-avtq in https://github.com/cloudfoundry/otel-collector-release/pull/26 * Add batch processor by @acrmp in https://github.com/cloudfoundry/otel-collector-release/pull/32 * Bump go.opentelemetry.io/collector/cmd/builder from 0.103.0 to 0.104.0 in /src/otel-collector-builder by @dependabot in https://github.com/cloudfoundry/otel-collector-release/pull/30 ## New Contributors * @benjaminguettmann-avtq made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/26 **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.5.0...v0.6.0</pre> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.22  | <p>▼ 4.6.22</p> <pre>* Add php 8.2.21, remove php 8.2.19 (#1073) for stack(s) cflinuxfs4, cflinuxfs3 * Add php 8.3.9, remove php 8.3.6 for stack(s) cflinuxfs4, cflinuxfs3 * Add httpd 2.4.61, remove httpd 2.4.59 for stack(s) cflinuxfs4, cflinuxfs3 * Add nginx 1.27.0 for stack(s) cflinuxfs3, cflinuxfs4 [#18786 2901] * Fix default nginx: it always need to main line * Remove dependency credential test (#1076) * Add composer 2.7.7, remove composer 2.7.6 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187768377">https://www.pivotaltracker.com/story/show/187768377</a>) * Add php 8.2.20, remove php 8.2.18 for stack(s) cflinuxfs3, cflinuxfs4 (<a href="https://www.pivotaltracker.com/story/show/187749745">https://www.pivotaltracker.com/story/show/187749745</a>)   name   version   cf_stacks   modules    - - -    appdynamics   23.11.0-839   cflinuxfs3, c flinuxfs4       composer   2.7.7   cflinuxfs3, cflinuxfs4       httpd   2.4.61   cflinuxfs3       httpd   2.4.61   cflinuxfs4       newrelic   10.21.0.11   cflinuxfs3, cflin uxfs4       nginx   1.26.1   cflinuxfs3       nginx   1.26.1   cflinuxfs4       nginx   1.27.0   cflinuxfs3       nginx   1.27.0   cflinuxfs4       php   8.1.27   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lz4, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, z lib     php   8.1.27   cflinuxfs4   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lz4, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>         ell, psr, rdkafka, readline, redis, shmop, sn         mp, soap, sockets, sodium, solr, sqlsrv, ssh         2, stomp, sysvmsg, sysvsem, sysvshm, tideways         _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z         lib              php   8.1.28   cflinuxfs3   amqp, apcu, b         z2, curl, dba, enchant, exif, fileinfo, ftp,         gd, gettext, gmp, igbinary, imagick, imap, io         ncube, ldap, lzf, mailparse, maxminddb, mbstr         ing, memcached, mongodb, msgpack, mysqli, oau         th, opcache, openssl, pcntl, pdo, pdo_firebir         d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit         e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp         ell, psr, rdkafka, readline, redis, shmop, sn         mp, soap, sockets, sodium, solr, sqlsrv, ssh         2, stomp, sysvmsg, sysvsem, sysvshm, tideways         _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z         lib              php   8.1.28   cflinuxfs4   amqp, apcu, b         z2, curl, dba, enchant, exif, fileinfo, ftp,         gd, gettext, gmp, igbinary, imagick, imap, io         ncube, ldap, lzf, mailparse, maxminddb, mbstr         ing, memcached, mongodb, msgpack, mysqli, oau         th, opcache, openssl, pcntl, pdo, pdo_firebir         d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit         e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp         ell, psr, rdkafka, readline, redis, shmop, sn         mp, soap, sockets, sodium, solr, sqlsrv, ssh         2, stomp, sysvmsg, sysvsem, sysvshm, tideways         _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z         lib              php   8.2.20   cflinuxfs3   amqp, apcu, b         z2, curl, dba, enchant, exif, fileinfo, ftp,         gd, gettext, gmp, igbinary, imagick, imap, io         ncube, ldap, lzf, mailparse, maxminddb, mbstr         ing, memcached, mongodb, msgpack, mysqli, oau         th, opcache, openssl, pcntl, pdo, pdo_firebir         d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit         e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp         ell, psr, rdkafka, readline, redis, shmop, sn         mp, soap, sockets, sodium, solr, sqlsrv, ssh         2, stomp, sysvmsg, sysvsem, sysvshm, tideways         _xhprof, tidy, xdebug, xsl, yaml, zip, zlib              php   8.2.20   cflinuxfs4   amqp, apcu, b         z2, curl, dba, enchant, exif, fileinfo, ftp,         gd, gettext, gmp, igbinary, imagick, imap, io         ncube, ldap, lzf, mailparse, maxminddb, mbstr         ing, memcached, mongodb, msgpack, mysqli, oau         th, opcache, openssl, pcntl, pdo, pdo_firebir         d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit         e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp         ell, psr, rdkafka, readline, redis, shmop, sn         mp, soap, sockets, sodium, solr, sqlsrv, ssh         2, stomp, sysvmsg, sysvsem, sysvshm, tideways         _xhprof, tidy, xdebug, xsl, yaml, zip, zlib              php   8.2.21   cflinuxfs3   amqp, apcu, b         z2, curl, dba, enchant, exif, fileinfo, ftp,         gd, gettext, gmp, igbinary, imagick, imap, io         ncube, ldap, lzf, mailparse, maxminddb, mbstr         ing, memcached, mongodb, msgpack, mysqli, oau         th, opcache, openssl, pcntl, pdo, pdo_firebir         d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit         e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp         ell, psr, rdkafka, readline, redis, shmop, sn         mp, soap, sockets, sodium, solr, sqlsrv, ssh         2, stomp, sysvmsg, sysvsem, sysvshm, tideways         _xhprof, tidy, xdebug, xsl, yaml, zip, zlib   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <p>gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.2.21   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.7   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.7   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.9   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> |  |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |          | <pre>y, xdebug, xsl, yaml, zip, zlib     php   8.3.9   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, g d, gettext, gmp, igbinary, imagick, imap, lda p, lzf, mailparse, maxminddb, mbstring, memca ched, mongodb, msgpack, mysqli, oauth, opcach e, openssl, pcntl, pdo, pdo_firebird, pdo_mys ql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqls rv, pgsql, phalcon, phpiredis, pspell, psr, r dkafka, readline, redis, shmop, snmp, soap, s ockets, sodium, solr, sqlsrv, ssh2, stomp, sy svmsg, sysvsem, sysvshm, tideways_xhprof, tid y, xdebug, xsl, yaml, zip, zlib     python   2.7.18   cflinuxfs4       ruby   3.0.5   cflinuxfs4     Default binary versions:   name   version    - -    php   8.1.27     httpd   2.4.61     newrelic   10.21.0.11     nginx   1.27.0     composer   2.7.7   * Uncached buildpack SHA256: bdbdd20d387c45 36f65fbcall6ba95422071b6749f658f3422bbec2c675 dc66 * Uncached buildpack SHA256: 388e97cf8efd51 1d6b95c1c08893d39da6da50778b152e557271830e7b1 408c8</pre> |
| push-apps-manager-release | 677.0.49 | <p>▼ 677.0.49</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <ul style="list-style-type: none"> <li>* add ability to modify autoscaler cooldown</li> </ul> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| push-offline-docs-release | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.114 | <p>▼ v674.0.114</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## Changes * creating final release 674.0.113 ## Dependencies * **app-usage-service:** Updated to v`d18f7 94` . For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre></div> <p>▼ v674.0.113</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## Changes * creating final release 674.0.112</pre></div> |
| pxc                        | 1.0.30    | <p>▼ v1.0.30</p> <div style="border: 1px solid #ccc; padding: 10px;"><ul style="list-style-type: none"><li>- jemalloc + profiling support</li><li>- bump to Percona-XtraDB-Cluster-5.7.44-31.65-2</li><li>- bump dependencies</li></ul></div>                                                                                                                                                                                                                                                                  |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.27  | <p>▼ 1.8.27</p> <pre>* Add python 3.12.4, remove python 3.12.3 for stack(s) cflinuxfs4, cflinuxfs3 * Add pip 24.1.1, remove pip 24.0 for stack(s) cflinuxfs4, cflinuxfs3 * Add miniconda3-py39 24.5.0, remove miniconda3-py39 24.4.0 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniconda3-py39   24.5.0   cflinuxfs3, cflinuxfs4     pip   24.1.1   cflinuxfs3, cflinuxfs4     pipenv   2023.12.1   cflinuxfs3     pipenv   2023.12.1   cflinuxfs4     python   3.8.19   cflinuxfs3     python   3.8.19   cflinuxfs4     python   3.9.19   cflinuxfs3     python   3.9.19   cflinuxfs4     python   3.10.14   cflinuxfs3     python   3.10.14   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     python   3.12.4   cflinuxfs3     python   3.12.4   cflinuxfs4     setuptools   70.1.1   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    python   3.10.x   * Uncached buildpack SHA256: f6cd97a5150f4e482355681c6d401487b7174387e6d327706a5cdcb7f69a574c * Uncached buildpack SHA256: 5175083a16e4fe694a466fe814192a1fb4f0f12800e38fe959b072e025ae8ae5</pre> |
| r-offline-buildpack      | 1.2.12  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| routing                  | 0.301.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack | 1.10.17 | <p>▼ 1.10.17</p> <pre>* Add jruby 9.4.8.0, remove jruby 9.4.7.0 for stack(s) cflinuxfs3, cflinuxfs4 * Add rubygems 3.5.15, remove rubygems 3.5.</pre> <p>14</p> <pre>for stack(s) cflinuxfs4, cflinuxfs3 * Add bundler 2.5.15, remove bundler 2.5.14 for stack(s) cflinuxfs4, cflinuxfs3 * Add ruby 3.3.4, remove ruby 3.3.1 for stack(s) cflinuxfs3, cflinuxfs4 * Add rubygems 3.5.14, remove rubygems 3.5.</pre> <p>10</p> <pre>for stack(s) cflinuxfs4, cflinuxfs3 * Add bundler 2.5.14, remove bundler 2.5.10 for stack(s) cflinuxfs4, cflinuxfs3 * Add ruby 3.3.2, remove ruby 3.3.0 (#952) for stack(s) cflinuxfs4, cflinuxfs3 * Add ruby 3.1.6, remove ruby 3.1.4 (#950) for stack(s) cflinuxfs3, cflinuxfs4 * Add node 20.15.0, remove node 20.12.2 for stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - -    bundler   2.5.15   cflinuxfs3, cflinuxfs4     jruby   9.4.8.0   cflinuxfs3     jruby   9.4.8.0   cflinuxfs4     node   20.15.0   cflinuxfs3     node   20.15.0   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4   ruby   3.1.5   cflinuxfs3     ruby   3.1.5   cflinuxfs4     ruby   3.1.6   cflinuxfs3     ruby   3.1.6   cflinuxfs4     ruby   3.2.2   cflinuxfs3     ruby   3.2.2   cflinuxfs4     ruby   3.2.3   cflinuxfs3     ruby   3.2.3   cflinuxfs4     ruby   3.2.4   cflinuxfs3     ruby   3.2.4   cflinuxfs4     ruby   3.3.2   cflinuxfs3     ruby   3.3.2   cflinuxfs4     ruby   3.3.4   cflinuxfs3     ruby   3.3.4   cflinuxfs4     rubygems   3.5.15   cflinuxfs3, cflinuxfs4 4     yarn   1.22.22   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    ruby   3.2.x   * Uncached buildpack SHA256: 111aa58f2c2066 595af6662954014ac2a0700e5855c53ec7c2ffee85320 c891a * Uncached buildpack SHA256: e672a43d947f9d</pre> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |         | 84c46ea9e3779a7a8628ac967d7e2a3d493df8c067620<br>40591                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| web-servers-cnb-buildpack | 0.15.0  | <p>▼ 0.15.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.18.0] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.18.0">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.18.0</a>)</li></ul></div> <p>▼ 0.14.4</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.17.2] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.2">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.2</a>)</li></ul></div> <p>▼ 0.14.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.17.2] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.2">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.2</a>)</li></ul></div> <p>▼ 0.14.2</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.17.1] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.1">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.1</a>)</li></ul></div> |
|                           |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk        | 3.47.0  | <p>▼ v3.47.0</p> <pre> ## 3.47.0 **Release Date**: July 19, 2024 ## Changes - Fixed a race condition in the pre-start script of vxlan-policy-agent that would cause failures if the iptables.lock file's director y was deleted by another process while the pr e-start was obtaining a lock. - Updated go-loggregator usage to v9 - Refactored polling logic of vxlan-policy- agent and silk-daemon - Bump to go 1.22.5 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.46.0...v3.47.0">https://github.com/cloudfoundry/silk-release/compare/v3.46.0...v3.47.0</a> ## Resources - [Download release 3.47.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/silk-release?version=3.47.0). </pre> |
| smb-volume  | 3.1.74  | <p>▼ v3.1.74</p> <pre> ## Changes * Golang: Updated to v1.22.5 (#428) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| smoke-tests | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.15  | <p>▼ 1.6.15</p> <pre>* Add nginx 1.27.0, remove 1.25 for stack(s) cflinuxfs3, cflinuxfs4 * Update default version to 1.27.0 * Add nginx 1.26.1, remove nginx 1.26.0 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187700030">https://www.pivotaltracker.com/story/show/187700030</a>)   name   version   cf_stacks    - -    nginx   1.26.1   cflinuxfs3     nginx   1.26.1   cflinuxfs4     nginx   1.27.0   cflinuxfs3     nginx   1.27.0   cflinuxfs4   Default binary versions:   name   version    -    nginx   1.27.x   * Uncached buildpack SHA256: 07fbf03c80de60 1a8883e95f21dadd4aa0ac7477c0384a7313428758dca 69e70 * Uncached buildpack SHA256: 4dda8229788372 2eef1253440b75ed48a415c7cd5adf771377cc7b5ad32 271bd</pre> |
| statsd-injector              | 1.11.41 | <p>▼ v1.11.41</p> <pre>## What's Changed * Bump dependencies * Bump to go1.21.12 **Full Changelog**: <a href="https://github.com/cdfoundry/statsd-injector-release/compare/v1.1.40...v1.11.41">https://github.com/cdfoundry/statsd-injector-release/compare/v1.1.40...v1.11.41</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| syslog                       | 12.3.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| system-metrics-scraper       | 4.0.9   | <p>▼ v4.0.9</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: <a href="https://github.com/cdfoundry/system-metrics-scraper-release/compare/v4.0.8...v4.0.9">https://github.com/cdfoundry/system-metrics-scraper-release/compare/v4.0.8...v4.0.9</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa       | 77.14.0 | <p>▼ v77.14.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.14.0] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.14.0">https://github.com/cloudfoundry/uaa/releases/tag/v77.14.0</a>) ### Misc * Fixed regression in release before, see <a href="https://github.com/cloudfoundry/uaa/issues/2963">https://github.com/cloudfoundry/uaa/issues/2963</a> * [Upgrade Bellsoft JDK to version 17.0.12+10] (<a href="https://github.com/cloudfoundry/uaa-release/commit/f14dc1e3c6adda10f37aca97d4165c3fe26cc7cd">https://github.com/cloudfoundry/uaa-release/commit/f14dc1e3c6adda10f37aca97d4165c3fe26cc7cd</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.13.0...v77.14.0">https://github.com/cloudfoundry/uaa-release/compare/v77.13.0...v77.14.0</a> </pre> <p>▼ v77.13.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.13.0] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.13.0">https://github.com/cloudfoundry/uaa/releases/tag/v77.13.0</a>) ### Misc * Add configuration option for origin check by @strehle in <a href="https://github.com/cloudfoundry/uaa-release/pull/914">https://github.com/cloudfoundry/uaa-release/pull/914</a> * [Upgrade Tomcat to version 9.0.91] (<a href="https://github.com/cloudfoundry/uaa-release/commit/cb7abbb1265de674249d19f606a161b97d23ef34">https://github.com/cloudfoundry/uaa-release/commit/cb7abbb1265de674249d19f606a161b97d23ef34</a>) ### Dependency Bumps * Bump minitest from 5.24.0 to 5.24.1 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/918">https://github.com/cloudfoundry/uaa-release/pull/918</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.474 to 0.0.475 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/920">https://github.com/cloudfoundry/uaa-release/pull/920</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.475 to 0.0.477 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/921">https://github.com/cloudfoundry/uaa-release/pull/921</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.477 to 0.0.478 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/922">https://github.com/cloudfoundry/uaa-release/pull/922</a> * Bump github.com/cloudfoundry/bosh-utils from 0.0.478 to 0.0.479 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/924">https://github.com/cloudfoundry/uaa-release/pull/924</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.12.0...v77.13.0">https://github.com/cloudfoundry/uaa-release/compare/v77.12.0...v77.13.0</a> </pre> |

| Component         | Version | Release Notes |
|-------------------|---------|---------------|
| tanzu-jammy-stack | 1.0.1   |               |

## 6.0.5

**Release Date:** 07/08/2024



### Caution

This release is affected by a known issue for customers who use both Postgres for the TAS for VMs database and TCP Routes. Users who use both Postgres and TCP Routes should not upgrade to this version. This only applies if Postgres is used for the core Cloud Foundry databases, not if apps use Postgres services.

- **[Known Issue]** Running `cf push --docker-image` may fail if specifying the image with SHA256 digests. This will be fixed in a future patch release. Workaround this by using the image tag instead of the digest.
- **[Feature Improvement]** Configure JWKS cache in UAA
- **[Feature Improvement]** Expose proxy metrics for internal MySQL
- **[Bug Fix]** Re-enables parallel applier threads for internal MySQL cluster
- **[Bug Fix]** Route Registrar only sends 5 unregistration messages in a row when a route becomes unhealthy. This prevents Gorouter's logs from filling up with unnecessary, repetitive log messages.
- Bump backup-and-restore-sdk to version [1.19.22](#)
- Bump bpm to version [1.2.22](#)
- Bump capi to version [1.185.0](#)
- Bump cf-autoscaling to version [250.2.5](#)
- Bump cf-cli to version [1.64.0](#)
- Bump cflinuxfs3 to version [0.390.0](#)
- Bump cflinuxfs4 to version [1.103.0](#)
- Bump credhub to version [2.12.80](#)
- Bump diego to version [2.100.0](#)
- Bump dotnet-core-offline-buildpack to version [2.4.29](#)
- Bump java-offline-buildpack to version [4.70.0](#)
- Bump java-native-image-cnb-buildpack to version [0.11.18](#)
- Bump log-cache to version [3.1.0](#)
- Bump mapfs to version [1.2.79](#)
- Bump nats to version [56.21.0](#)

- Bump nfs-volume to version 7.1.74
- Bump nginx-offline-buildpack to version 1.2.15
- Bump otel-collector to version 0.5.0
- Bump php-offline-buildpack to version 4.6.20
- Bump push-apps-manager-release to version 677.0.48
- Bump push-usage-service-release to version 674.0.112
- Bump pxc to version 1.0.29
- Bump python-offline-buildpack to version 1.8.26
- Bump routing to version 0.301.0
- Bump web-servers-cnb-buildpack to version 0.14.1
- Bump smb-volume to version 3.1.73
- Bump syslog to version 12.3.0
- Bump uaa to version 77.12.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.486   |               |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk   | 1.19.22 | <p>▼ v1.19.22</p> <pre>## Dependencies * **storage:** Updated to v1.42.0. For more information, see [storage](https://github.com/googleapis/google-cloud-go). * **api:** Updated to v0.184.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> <p>▼ v1.19.21</p> <pre>## Changes * Bump Ruby from 3.2.2 to 3.3.1 (#1715) * Bump pcre2 from 10.43 to 10.44 (#1716) * Golang: Updated to v1.22.4. (#1714) ## Dependencies * **net:** Updated to v0.26.0. For more information, see [net](https://github.com/golang/net). * **api:** Updated to v0.183.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> <p>▼ v1.19.20</p> <pre>## Dependencies * **bosh-backup-and-restore:** Updated to v1.9.65. For more information, see [bosh-backup-and-restore](https://github.com/cloudfoundry-incubator/bosh-backup-and-restore). * **v2:** Updated to v2.19.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **api:** Updated to v0.182.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> <p>▼ v1.19.17</p> <pre>## Dependencies * **storage:** Updated to v1.41.0. For more information, see [storage](https://github.com/googleapis/google-cloud-go).</pre> |
| binary-offline-buildpack | 1.1.12  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| bpm                      | 1.2.22  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| capi             | 1.185.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| cf-autoscaling   | 250.2.5        | <p>▼ v250.2.5</p> <div style="border: 1px solid #ccc; padding: 10px;"> <ul style="list-style-type: none"> <li>* Bump dependencies</li> <li>* Bump packaged Golang to 1.21.11</li> <li>* Fix JSON parsing of CAPI responses that don't use pretty-printing</li> </ul> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| cf-cli           | 1.64.0         | <p>▼ v1.64.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>### Included CF CLI versions: 7.7.10 8.7.10</pre> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| cf-networking    | 3.46.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| cflinuxfs3       | 0.390.0        | <p>▼ v0.390.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.390.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.390.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.390.0</a>)</p> </div> <p>▼ v0.389.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.389.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.389.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.389.0</a>)</p> </div> <p>▼ v0.388.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.388.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.388.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.388.0</a>)</p> </div> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4 | 1.103.0 | <p>▼ v1.103.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.103.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.103.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.103.0</a>)</p> </div> <p>▼ v1.102.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.102.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.102.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.102.0</a>)</p> </div> <p>▼ v1.101.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.101.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.101.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.101.0</a>)</p> </div> <p>▼ v1.100.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.100.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.100.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.100.0</a>)</p> </div> <p>▼ v1.99.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.99.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.99.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.99.0</a>)</p> </div> <p>▼ v1.98.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.98.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.98.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.98.0</a>)</p> </div> <p>▼ v1.97.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.97.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.97.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.97.0</a>)</p> </div> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                        |
|-----------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | v1.96.0 | <p>This release ships with cflinuxfs4 version 1.96.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.96.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.96.0</a>)</p> |
|                       | v1.95.0 | <p>This release ships with cflinuxfs4 version 1.95.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.95.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.95.0</a>)</p> |
|                       | v1.94.0 | <p>This release ships with cflinuxfs4 version 1.94.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.94.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.94.0</a>)</p> |
|                       | v1.93.0 | <p>This release ships with cflinuxfs4 version 1.93.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.93.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.93.0</a>)</p> |
|                       | v1.92.0 | <p>This release ships with cflinuxfs4 version 1.92.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.92.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.92.0</a>)</p> |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                      |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub   | 2.12.80 | <p>▼ 2.12.80</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.79...2.12.80">https://github.com/pivotal/credhub-release/compare/2.12.79...2.12.80</a></pre> <p>▼ 2.12.79</p> <pre>## What's Changed * Build(deps): Bump rspec-expectations from 3.13.0 to 3.13.1 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/221 **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.78...2.12.79">https://github.com/pivotal/credhub-release/compare/2.12.78...2.12.79</a></pre> <p>▼ 2.12.78</p> <pre>## What's Changed * Bumped various dependencies. * Added a missing index on `credential_version` table's FK column to `credential` table for PostgreSQL database. **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.77...2.12.78">https://github.com/pivotal/credhub-release/compare/2.12.77...2.12.78</a></pre> <p>▼ 2.12.77</p> <pre>## What's Changed * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.76...2.12.77">https://github.com/pivotal/credhub-release/compare/2.12.76...2.12.77</a></pre> <p>▼ 2.12.76</p> <pre>## What's Changed * Build(deps): Bump rubocop from 1.63.5 to 1.64.0 in /spec by @dependabot in https://github.com/pivotal/credhub-release/pull/214 **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.75...2.12.76">https://github.com/pivotal/credhub-release/compare/2.12.75...2.12.76</a></pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.100.0 | <p>▼ v2.100.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## Changes - Bumped loggregator usage to loggregator v9 - Thanks @Birdrock! - Bumped cfhttp usage to cfhttp v2 - Thanks @jrussell ! - Bumped go dependency bumps ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.99.0...v2.100.0">https://github.com/cloudfoundry/diego-release/compare/v2.99.0...v2.100.0</a> ## Resources - [Download release 2.100.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.100.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.100.0</a>).</pre></div> |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.29  | <p>▼ 2.4.29</p> <pre> * Remove .NET 7 * Rebuild node 20.14.0 (#994) for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 8.0.301, remove dotnet-sdk 8.0.300 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 6.0.31, remove dotnet- runtime 6.0.30 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 8.0.6, remove dotne- t-aspnetcore 8.0.5 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 6.0.423, remove dotnet-sd 6.0.422 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 6.0.31, remove dotn et-aspnetcore 6.0.30 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 8.0.6, remove dotnet-r untime 8.0.5 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.31   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.6   cflinuxfs3, c flinuxfs4     dotnet-runtime   6.0.31   cflinuxfs3, cfl inuxfs4     dotnet-runtime   8.0.6   cflinuxfs3, cfl inuxfs4     dotnet-sdk   6.0.423   cflinuxfs3, cflinu xfs4     dotnet-sdk   8.0.301   cflinuxfs3, cflinu xfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.14.0   cflinuxfs3     node   20.14.0   cflinuxfs4   Default binary versions:   name   version    - -    dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 8033951a304d8c </pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                       |
|------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |         | <p>4ec2e7f14672b925fdb1a0eec72a1f2b7ebd9008d709cf<br/>fd0fd</p> <ul style="list-style-type: none"><li>* Uncached buildpack SHA256: 5cf8cda60cd15159cf<br/>fc242e53378935c2323c1c7899d8f3136956c62ca9280da</li></ul> |
| garden-runc            | 1.53.0  |                                                                                                                                                                                                                     |
| go-offline-buildpack   | 1.10.19 |                                                                                                                                                                                                                     |
| java-offline-buildpack | 4.70.0  |                                                                                                                                                                                                                     |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-native-image-cnb-buildpack | 0.11.18 | <p>▼ 0.11.18</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.8] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.8">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.8</a>)</li> </ul> </div> <p>▼ 0.11.17</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.7] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.7">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.7</a>)</li> </ul> </div> <p>▼ 0.11.16</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.6] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6</a>)</li> </ul> </div> <p>▼ 0.11.15</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.6] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6</a>)</li> </ul> </div> <p>▼ 0.11.14</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.6] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6</a>)</li> </ul> </div> <p>▼ 0.11.13</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.6] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.6</a>)</li> </ul> </div> <p>▼ 0.11.12</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.13.5] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.5">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.5</a>)</li> </ul> </div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>▼ 0.11.11</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.5] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.5">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.5</a>)</li></ul></div> <p>▼ 0.11.10</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.4] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.4">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.4</a>)</li></ul></div> <p>▼ 0.11.9</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.4] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.4">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.4</a>)</li></ul></div> <p>▼ 0.11.8</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.4] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.4">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.4</a>)</li></ul></div> <p>▼ 0.11.7</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.3] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.3">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.3</a>)</li></ul></div> <p>▼ 0.11.6</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.3] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.3">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.3</a>)</li></ul></div> <p>▼ 0.11.5</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.2] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.2">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.2</a>)</li></ul></div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>▼ 0.11.4</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.2] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.2">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.2</a>)</li></ul></div> <p>▼ 0.11.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.1] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.1">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.1</a>)</li></ul></div> <p>▼ 0.11.2</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.1] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.1">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.1</a>)</li></ul></div> <p>▼ 0.11.1</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.0] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.0">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.0</a>)</li></ul></div> <p>▼ 0.11.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.13.0] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.0">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.13.0</a>)</li></ul></div> <p>▼ 0.10.7</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.12.6] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.6">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.6</a>)</li></ul></div> <p>▼ 0.10.6</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.12.5] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.5">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.5</a>)</li></ul></div> |

| Component         | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |          | <p>▼ 0.10.5</p> <div style="border: 1px solid #ccc; padding: 10px;"> <b>Components:</b> <ul style="list-style-type: none"> <li>* [buildpack v0.12.5] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.5">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.5</a>)</li> </ul> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| log-cache         | 3.1.0    | <p>▼ v3.1.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.10 * Add configuration to make whitespace trimming in log messages optional by @chombium in <a href="https://github.com/cloudfoundry/log-cache-release/pull/506">https://github.com/cloudfoundry/log-cache-release/pull/506</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.0.12...v3.1.0">https://github.com/cloudfoundry/log-cache-release/compare/v3.0.12...v3.1.0</a></pre> </div>                                                                                                                                                                                                                                                                                     |
| loggregator       | 107.0.14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| loggregator-agent | 8.1.1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| mapfs             | 1.2.79   | <p>▼ v1.2.79</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Add final release 1.2.72 [ci skip] * Golang: Updated to v1.22.4 (#269) * bump mapfs ## Dependencies * **v2:** Updated to v2.19.0.  For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **mapfs:** Updated to v`756bafb`.  For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> </div> <p>▼ v1.2.72</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Add final release 1.2.71 [ci skip] * Bump mapfs (#263) ## Dependencies * **mapfs:** Updated to v`ac01341`.  For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> </div> |
| metric-registrar  | 4.0.0    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mysql-monitoring | 10.15.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| nats             | 56.21.0 | <p>▼ v56.21.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## Changes - Dependency bumps ## Built with go 1.22.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.20.0...v56.21.0">https://github.com/cloudfoundry/nats-release/compare/v56.20.0...v56.21.0</a> ## Resources - [Download release 56.21.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.21.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.21.0</a>).</pre></div> <p>▼ v56.20.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## Changes - Dependency bumps ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.19.0...v56.20.0">https://github.com/cloudfoundry/nats-release/compare/v56.19.0...v56.20.0</a> ## Resources - [Download release 56.20.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.20.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.20.0</a>).</pre></div> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.1.74  | <p>▼ v7.1.74</p> <pre>## Changes * Golang: Updated to v1.22.4 (#963)</pre> <p>▼ v7.1.73</p> <pre>## Changes * Add final release 7.1.72 [ci skip] * Use cf create update-service-broker to register the service (#972) * Bump openssl- from 3.3.0 to 3.3.1 (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/959">https://github.com/cloudfoundry/nfs-volume-release/pull/959</a>) * Golang: Updated to v1.22.4 (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/962">https://github.com/cloudfoundry/nfs-volume-release/pull/962</a>)</pre> <p>▼ v7.1.72</p> <pre>## Changes * Add final release 7.1.71 [ci skip] * Bump openssl- from 3.3.0 to 3.3.1 (#959) * Golang: Updated to v1.22.4 (#962)</pre> <p>▼ v7.1.71</p> <pre>## Changes ## Dependencies * **nfsbroker:** Updated to v`b8ale4c`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>).</pre> <p>▼ v7.1.68</p> <pre>## Changes * Add final release 7.1.66 [ci skip] * Bump submodules (#938) ## Dependencies * **nfsbroker:** Updated to v`e1d14e4`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>).</pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack  | 1.2.15  | <p>▼ 1.2.15</p> <pre>* Add nginx 1.26.1, remove nginx 1.26.0 (#285) for stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - - -   nginx   1.25.5   cflinuxfs3     nginx   1.25.5   cflinuxfs4     nginx   1.26.1   cflinuxfs3     nginx   1.26.1   cflinuxfs4     openresty   1.21.4.2   cflinuxfs3     openresty   1.21.4.2   cflinuxfs4     openresty   1.25.3.1   cflinuxfs3     openresty   1.25.3.1   cflinuxfs4   Default binary versions:   name   version    - -   nginx   1.25.x   * Uncached buildpack SHA256: 98463e90b84aab e86f8caf355130d85b560c2b233e919df61d0469fda0a 5ae47 * Uncached buildpack SHA256: 01e3e11ea53e1d 3a5bc88c49c43f2b131cedacea2659094b0f43dc7e540 307ed</pre> |
| nodejs-offline-buildpack | 1.8.25  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| notifications            | 70.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| notifications-ui         | 47.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| otel-collector           | 0.5.0   | <p>▼ v0.5.0</p> <pre>## What's Changed * Bump otel-collector to v0.103.0 in https://github.com/cloudfoundry/otel-collector-release/pull/28.   * If you have configured exporters to use persistent queues note that [re-enqueuing of failed batches has been removed] (https://github.com/open-telemetry/opentelemetry-collector/releases/tag/v0.92.0).   * Bump to [g01.21.11] (https://groups.google.com/g/golang-announce/c/XbxouI9gY7k/m/TuoGEhxIEwAJ).   **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.1...v0.5.0</pre>                                                                                                                                          |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.20  | <p>▼ 4.6.20</p> <pre>* Add php 8.1.28, remove php 8.1.26 (#1056) for stack(s) cflinuxfs4, cflinuxfs3 (https://www.pivotaltracker.com/story/show/ 187422133) * Rebuild php 8.3.6 (#1055) for stack(s) cflinuxfs4, cflinuxfs3 (https://www.pivotaltracker.com/story/show/ 187414040) * Rebuild php 8.2.18 (#1054) for stack(s) cflinuxfs4, cflinuxfs3 (https://www.pivotaltracker.com/story/show/ 187413454) * Rebuild php 8.1.27 (#1053) for stack(s) cflinuxfs4, cflinuxfs3 (https://www.pivotaltracker.com/story/show/ 186787155) * Rebuild php 8.3.7 (#1058) * Rebuild php 8.2.19 (#1057) * Add nginx 1.26.1, remove nginx 1.26.0 (#1 050) for stack(s) cflinuxfs4, cflinuxfs3 (https://www.pivotaltracker.com/story/show/ 187700030) * Update php defaults for 8.1.x (#1059) * Update New Relic PHP agent to latest (10. 21.0.11)   name   version   cf_stacks   modules    - - -    appdynamics   23.11.0-839   cflinuxfs3, c flinuxfs4       composer   2.7.6   cflinuxfs3, cflinuxfs4       httpd   2.4.59   cflinuxfs3       httpd   2.4.59   cflinuxfs4       newrelic   10.21.0.11   cflinuxfs3, cflin uxfs4       nginx   1.25.5   cflinuxfs3       nginx   1.25.5   cflinuxfs4       nginx   1.26.1   cflinuxfs3       nginx   1.26.1   cflinuxfs4       php   8.1.27   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lz4, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib     php   8.1.27   cflinuxfs4   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp,</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <pre> gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib      php   8.1.28   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib      php   8.1.28   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib      php   8.2.18   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib      php   8.2.18   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lztf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell </pre> |  |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>       ell, psr, rdkafka, readline, redis, shmop, sn       mp, soap, sockets, sodium, solr, sqlsrv, ssh       2, stomp, sysvmsg, sysvsem, sysvshm, tideways       _xhprof, tidy, xdebug, xsl, yaml, zip, zlib             php   8.2.19   cflinuxfs3   amqp, apcu, bz           2, curl, dba, enchant, exif, fileinfo, ftp,           gd, gettext, gmp, igbinary, imagick, imap, io           ncube, ldap, lzsf, mailparse, maxminddb, mbstr           ing, memcached, mongodb, msgpack, mysqli, oau           th, opcache, openssl, pcntl, pdo, pdo_firebir           d, pdo_mysql, pdo_odb, pdo_pgsql, pdo_sqlit           e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp           ell, psr, rdkafka, readline, redis, shmop, sn           mp, soap, sockets, sodium, solr, sqlsrv, ssh           2, stomp, sysvmsg, sysvsem, sysvshm, tideways           _xhprof, tidy, xdebug, xsl, yaml, zip, zlib                 php   8.2.19   cflinuxfs4   amqp, apcu, bz               2, curl, dba, enchant, exif, fileinfo, ftp,               gd, gettext, gmp, igbinary, imagick, imap, io               ncube, ldap, lzsf, mailparse, maxminddb, mbstr               ing, memcached, mongodb, msgpack, mysqli, oau               th, opcache, openssl, pcntl, pdo, pdo_firebir               d, pdo_mysql, pdo_odb, pdo_pgsql, pdo_sqlit               e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp               ell, psr, rdkafka, readline, redis, shmop, sn               mp, soap, sockets, sodium, solr, sqlsrv, ssh               2, stomp, sysvmsg, sysvsem, sysvshm, tideways               _xhprof, tidy, xdebug, xsl, yaml, zip, zlib                     php   8.3.6   cflinuxfs3   amqp, apcu, bz                   2, curl, dba, enchant, exif, fileinfo, ftp,                   gd, gettext, gmp, igbinary, imagick, imap, lda                   p, lzsf, mailparse, maxminddb, mbstring, memca                   ched, mongodb, msgpack, mysqli, oauth, opcache                   , openssl, pcntl, pdo, pdo_firebird, pdo_my                   ql, pdo_odb, pdo_pgsql, pdo_sqlite, pdo_sq                   lsrv, pgsql, phalcon, phpiredis, pspell, psr, r                   dkafka, readline, redis, shmop, snmp, soap, s                   ockets, sodium, solr, sqlsrv, ssh2, stomp, sy                   svmsg, sysvsem, sysvshm, tideways_xhprof, tid                   y, xdebug, xsl, yaml, zip, zlib                         php   8.3.6   cflinuxfs4   amqp, apcu, bz                       2, curl, dba, enchant, exif, fileinfo, ftp,                       gd, gettext, gmp, igbinary, imagick, imap, lda                       p, lzsf, mailparse, maxminddb, mbstring, memca                       ched, mongodb, msgpack, mysqli, oauth, opcache                       , openssl, pcntl, pdo, pdo_firebird, pdo_my                       ql, pdo_odb, pdo_pgsql, pdo_sqlite, pdo_sq                       lsrv, pgsql, phalcon, phpiredis, pspell, psr, r                       dkafka, readline, redis, shmop, snmp, soap, s                       ockets, sodium, solr, sqlsrv, ssh2, stomp, sy                       svmsg, sysvsem, sysvshm, tideways_xhprof, tid                       y, xdebug, xsl, yaml, zip, zlib                             php   8.3.7   cflinuxfs3   amqp, apcu, bz                           2, curl, dba, enchant, exif, fileinfo, ftp,                           gd, gettext, gmp, igbinary, imagick, imap, lda                           p, lzsf, mailparse, maxminddb, mbstring, memca                           ched, mongodb, msgpack, mysqli, oauth, opcache   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> e, openssl, pcntl, pdo, pdo_firebird, pdo_myse ql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sq lrv, pgsql, phalcon, phpiredis, pspell, psr, r dkafka, readline, redis, shmop, snmp, soap, s ockets, sodium, solr, sqlsrv, ssh2, stomp, sy svmsg, sysvsem, sysvshm, tideways_xhprof, tidi y, xdebug, xsl, yaml, zip, zlib     php   8.3.7   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, g d, gettext, gmp, igbinary, imagick, imap, lda p, lzf, mailparse, maxminddb, mbstring, memca ched, mongodb, msgpack, mysqli, oauth, opcach e, openssl, pcntl, pdo, pdo_firebird, pdo_myse ql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sq lrv, pgsql, phalcon, phpiredis, pspell, psr, r dkafka, readline, redis, shmop, snmp, soap, s ockets, sodium, solr, sqlsrv, ssh2, stomp, sy svmsg, sysvsem, sysvshm, tideways_xhprof, tidi y, xdebug, xsl, yaml, zip, zlib     python   2.7.18   cflinuxfs4       ruby   3.0.5   cflinuxfs4     Default binary versions:   name   version    - -    php   8.1.27     httpd   2.4.59     newrelic   10.21.0.11     nginx   1.26.1     composer   2.7.6   * Uncached buildpack SHA256: 4d4fc70c5cf5ebff88c1ba0844e973c7715fde3400b10076f3b1045c9262a31 * Uncached buildpack SHA256: bd145ea864adf3c71c72fff90638ab57a3bf5afed057a80d2e991de8fae694e9 </pre> |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-apps-manager-release | 677.0.48 | <p>▼ 677.0.48</p> <div style="border: 1px solid black; padding: 5px;"><ul style="list-style-type: none"><li>* correct user view of tcp routes. No longer displayed as "https://" and the port is now part of the uri rather than a grey label beside the uri.</li></ul></div> <p>▼ 677.0.47</p> <div style="border: 1px solid black; padding: 5px;"><ul style="list-style-type: none"><li>* add fix to new routing view</li><li>* fix bug with shared services causing crashes</li></ul></div> <p>▼ 677.0.46</p> <div style="border: 1px solid black; padding: 5px;"><ul style="list-style-type: none"><li>* New version of the Map route for applications. More dynamic. Allows for creation of tcp routes. Fixes optionality of fields.</li></ul></div> |
| push-offline-docs-release | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-usage-service-release | 674.0.112 | <p>▼ v674.0.112</p> <pre>## Changes * creating final release 674.0.105 ## Dependencies * **app-usage-service:** Updated to v`4e6bc6a`.</pre> <p>For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</p> <p>▼ v674.0.105</p> <pre>## Dependencies * **app-usage-service:** Updated to v`809e359`.</pre> <p>For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</p> <p>▼ v674.0.104</p> <pre>## Changes * Maintenance release (internal technical work, CI improvements, etc)</pre> <p>▼ v674.0.103</p> <pre>## Dependencies * **app-usage-service:** Updated to v`98e365c`.</pre> <p>For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</p> |
| pxc                        | 1.0.29    | <p>▼ v1.0.29</p> <pre>## Release Notes **Dependency bumps** - Updates packages and dependencies **Bugs fixed** - Fixes a bug that could lead to the Galera -init job hanging at pre-start phase from a schema deadlock</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.26  | <p>▼ 1.8.26</p> <pre>* vendored apps with sdist: install common build-time dependencies in staging (#922)   name   version   cf_stacks    - -    libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniconda3-py39   24.4.0   cflinuxfs3, cflinuxfs4     pip   24.0   cflinuxfs3, cflinuxfs4     pipenv   2023.12.1   cflinuxfs3     pipenv   2023.12.1   cflinuxfs4     python   3.8.19   cflinuxfs3     python   3.8.19   cflinuxfs4     python   3.9.19   cflinuxfs3     python   3.9.19   cflinuxfs4     python   3.10.14   cflinuxfs3     python   3.10.14   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     python   3.12.3   cflinuxfs3     python   3.12.3   cflinuxfs4     setuptools   70.0.0   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    python   3.10.x   * Uncached buildpack SHA256: 684e6da0cc8269 50b436debdabd14c036a0d60461ed6457f1ead6a9fe99 a91f7 * Uncached buildpack SHA256: 2465bb4b302cf9 cc20c7785cac068f70e1d0855f8ec8aa37ffee5ead360 47be7</pre> |
| r-offline-buildpack      | 1.2.12  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.301.0 | <p>▼ v0.301.0</p> <pre> ## Changes - Fixes a bug introduced in [v0.298.0] (https://github.com/cloudfoundry/routing-release/releases/tag/v0.298.0) where the `X-Forwarded-Host` header was incorrectly set for requests containing an `Expect: 100-continue` header. Thanks @maxmoehl ! ## Built with go 1.22.4 **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.300.0...v0.301.0 ## Resources - [Download release 0.301.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.301.0). </pre> <p>▼ v0.300.0</p> <pre> ## Changes - Update route registrar to only send 5 unregistration messages for an unhealthy route - https://github.com/cloudfoundry/route-registrar/pull/46 . Thanks @andy-a-d-nguyen for your first contribution to CF! ## Built with go 1.22.4 ## Resources - [Download release 0.300.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.300.0). **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.299.0...v0.300.0 </pre> <p>▼ v0.299.0</p> <pre> ## Changes - Bumped to Golang 1.22.4 - Added ability to enforce strict validation of route service signature. Thanks @maxmoehl, @b1tamara and @plowin ! ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 8269440b..60c7b520 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -262,6 +262,9 @@  properties:    router.route_services_timeout:      description: "Expiry time of a route service signature in seconds"      default: 60 ``` </pre> |
|           |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |         | <pre>+   router.route_services_strict_signature_validation: +     description: "Enforce strict validation of a route service signature" +     default: false router.max_header_kb: description:     This value controls the maximum number of bytes (in KB) the gorouter will read   ```  ## Built with go 1.22.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.298.0...v0.299.0">https://github.com/cloudfoundry/routing-release/compare/v0.298.0...v0.299.0</a> ## Resources - [Download release 0.299.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.299.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.299.0</a>).</pre> |
| ruby-offline-buildpack | 1.10.15 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| <b>Component</b>          | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| web-servers-cnb-buildpack | 0.14.1         | <p>▼ 0.14.1</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.17.1] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.1">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.1</a>)</li> </ul> </div> <p>▼ 0.14.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.17.0] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.0">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.17.0</a>)</li> </ul> </div> <p>▼ 0.13.14</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.16.5] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.5">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.5</a>)</li> </ul> </div> <p>▼ 0.13.13</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.16.5] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.5">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.5</a>)</li> </ul> </div> <p>▼ 0.13.12</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.16.5] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.5">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.5</a>)</li> </ul> </div> <p>▼ 0.13.11</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.16.4] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.4">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.4</a>)</li> </ul> </div> <p>▼ 0.13.10</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Components:</p> <ul style="list-style-type: none"> <li>* [buildpack v0.16.3] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3</a>)</li> </ul> </div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>▼ 0.13.9</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.3] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3</a>)</li></ul></div> <p>▼ 0.13.8</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.3] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3</a>)</li></ul></div> <p>▼ 0.13.7</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.3] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3</a>)</li></ul></div> <p>▼ 0.13.6</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.3] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.3</a>)</li></ul></div> <p>▼ 0.13.5</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.2] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.2">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.2</a>)</li></ul></div> <p>▼ 0.13.4</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.2] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.2">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.2</a>)</li></ul></div> <p>▼ 0.13.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>Components:</p><ul style="list-style-type: none"><li>* [buildpack v0.16.2] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.2">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.2</a>)</li></ul></div> |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk                         | 3.46.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| smb-volume                   | 3.1.73  | <p>▼ v3.1.73</p> <pre>## Changes ## Dependencies * **smbdriver:** Updated to v`9ec4dc3`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.72</p> <pre>## Changes * Bump smbdriver (#414) * Golang: Updated to v1.22.4 (#422) * Use cf create update-service-broker to register the service (#424) ## Dependencies * **v2:** Updated to v2.19.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **smbdriver:** Updated to v`4b6cce2`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.69</p> <pre>## Changes * Add final release 3.1.68 [ci skip] ## Dependencies * **smbbroker:** Updated to v`da19354`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`6a0de14`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver).</pre> |
| smoke-tests                  | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| staticfile-offline-buildpack | 1.6.13  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| statsd-injector              | 1.11.40 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| syslog                 | 12.3.0  | <p>▼ v12.3.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## What's Changed ### Features * Use service command to restart rsyslog, enabling BOSH Lite deployment by @ohkyle in https://github.com/cloudfoundry/syslog-release/pull/178 ### Maintenance * Bump blackbox dependencies * Bump packaged Golang to go1.21.11 ## New Contributors * @ohkyle made their first contribution in https://github.com/cloudfoundry/syslog-release/pull/178 **Full Changelog**: https://github.com/cloudfoundry/syslog-release/compare/v12.2.5...v12.3.0</pre></div> |
| system-metrics-scraper | 4.0.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa       | 77.12.0 | <p>▼ v77.12.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.12.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.12.0) ### Misc * Enable configuring of cache for Identity providers in UAA by @coolgang123 in https://github.com/cloudfoundry/uaa-release/pull/906 * Add more configurations for Identity providers in UAA by @strehle in https://github.com/cloudfoundry/uaa-release/pull/913 ### Dependency Bumps * [Upgrade Tomcat to version 9.0.90] (https://github.com/cloudfoundry/uaa-release/commit/bf65dd1b02f9b02e86e232eb063908f0a8105cd8) * Bump nokogiri from 1.16.5 to 1.16.6 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/907 * Bump rspec-expectations from 3.13.0 to 3.13.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/908 * Bump github.com/cloudfoundry/bosh-utils from 0.0.472 to 0.0.473 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/912 * Bump minitest from 5.23.1 to 5.24.0 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/915 * Bump github.com/cloudfoundry/bosh-utils from 0.0.473 to 0.0.474 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/917 ## New Contributors * @coolgang123 made their first contribution in https://github.com/cloudfoundry/uaa-release/pull/906 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.11.0...v77.12.0 </pre> <p>▼ v77.11.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.11.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.11.0) * [Support Alias feature in experimental mode] (https://github.com/cloudfoundry/uaa/blob/develop/docs/UAA-Alias-Entities.md) * Specification for "login.aliasEntitiesEnabled" Setting by @adrianhoelzl-sap in https://github.com/cloudfoundry/uaa-release/pull/899 ### Dependency Bumps </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>* Bump concurrent-ruby from 1.2.3 to 1.3.1 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/894">https://github.com/cloudfoundry/uaa-release/pull/894</a></li> <li>* Bump mini_portile2 from 2.8.6 to 2.8.7 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/895">https://github.com/cloudfoundry/uaa-release/pull/895</a></li> <li>* Bump github.com/cloudfoundry/bosh-utils from 0.0.467 to 0.0.469 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/896">https://github.com/cloudfoundry/uaa-release/pull/896</a></li> <li>* Bump activesupport from 7.1.3.3 to 7.1.3.4 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/901">https://github.com/cloudfoundry/uaa-release/pull/901</a></li> <li>* Bump github.com/cloudfoundry/bosh-utils from 0.0.469 to 0.0.471 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/900">https://github.com/cloudfoundry/uaa-release/pull/900</a></li> <li>* Bump github.com/cloudfoundry/bosh-utils from 0.0.471 to 0.0.472 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/902">https://github.com/cloudfoundry/uaa-release/pull/902</a></li> <li>* Bump concurrent-ruby from 1.3.1 to 1.3.3 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/905">https://github.com/cloudfoundry/uaa-release/pull/905</a></li> <li>## New Contributors</li> <li>* @adrianhoelzl-sap made their first contribution in <a href="https://github.com/cloudfoundry/uaa-release/pull/899">https://github.com/cloudfoundry/uaa-release/pull/899</a></li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.10.0...v77.11.0">https://github.com/cloudfoundry/uaa-release/compare/v77.10.0...v77.11.0</a></li> </ul> |

#### ▼ v77.10.0

```

## What's Changed
### New UAA
* Bump to [UAA v77.10.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.10.0)
### Misc
* [Upgrade Bellsoft JDK to version 17.0.11+12] (https://github.com/cloudfoundry/uaa-release/commit/6b4ec004cfccb61d6bd30e935a39af5fd2822a9)
### Dependency Bumps
* Bump github.com/cloudfoundry/bosh-utils from 0.0.463 to 0.0.464 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/873
* Bump github.com/cloudfoundry/bosh-utils from 0.0.464 to 0.0.465 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/875
* Bump nokogiri from 1.16.4 to 1.16.5 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/878
* Bump minitest from 5.22.3 to 5.23.0 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/879

```

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                   |         | <pre> uaa-release/pull/879   * Bump github.com/cloudfoundry/bosh-utils from 0.0.465 to 0.0.466 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/883   * Ignore bosh-utils bump in uaa v74.5.x branch. by @hsinn0 in https://github.com/cloudfoundry/uaa-release/pull/890   * Bump activesupport from 7.1.3.2 to 7.1.3.3 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/880   * Bump minitest from 5.23.0 to 5.23.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/888   * Bump racc from 1.7.3 to 1.8.0 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/882   * Bump github.com/cloudfoundry/bosh-utils from 0.0.466 to 0.0.467 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/893   **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.9.0...v77.10.0 </pre> |  |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |

## 6.0.4

**Release Date:** 05/29/2024

- **[Feature Improvement]** metric-registrar uses syslog binding cache, reducing load on Cloud Controllers
- **[Bug Fix]** Apps-manager large route list display failure
- **[Bug Fix]** Remove replication-canary
- **[Bug Fix]** App Autoscaler resolves incompatibility with load balancers that reject POST requests without a Content-Length header.
- **[Bug fix]** Automatically restart Route Emitter after multiple failed attempts to greet Gorouter. This fixes a [rare bug](#) that prevented Route Emitter from being able to register routes.
- Bump backup-and-restore-sdk to version [1.19.16](#)
- Bump binary-offline-buildpack to version [1.1.12](#)
- Bump bpm to version [1.2.19](#)
- Bump capi to version [1.182.0](#)
- Bump cf-autoscaling to version [250.2.4](#)
- Bump cflinuxfs4 to version [1.91.0](#)

- Bump credhub to version 2.12.75
- Bump diego to version 2.99.0
- Bump dotnet-core-offline-buildpack to version 2.4.28
- Bump garden-runc to version 1.53.0
- Bump go-offline-buildpack to version 1.10.19
- Bump java-offline-buildpack to version 4.69.0
- Bump java-native-image-cnb-buildpack to version 0.10.4
- Bump mapfs to version 1.2.70
- Bump metric-registrar to version 4.0.0
- Bump mysql-monitoring to version 10.15.0
- Bump nfs-volume to version 7.1.66
- Bump nodejs-offline-buildpack to version 1.8.25
- Bump php-offline-buildpack to version 4.6.19
- Bump push-apps-manager-release to version 677.0.45
- Bump push-usage-service-release to version 674.0.101
- Bump pxc to version 1.0.28
- Bump python-offline-buildpack to version 1.8.25
- Bump r-offline-buildpack to version 1.2.12
- Bump routing to version 0.298.0
- Bump ruby-offline-buildpack to version 1.10.15
- Bump web-servers-cnb-buildpack to version 0.13.2
- Bump smb-volume to version 3.1.68
- Bump uaa to version 77.9.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.445   |               |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk | 1.19.16 | <p>▼ v1.19.16</p> <pre>## Changes * Bump postgresql from 15.6 to 15.7 (#1678) ## Dependencies * **api:** Updated to v0.180.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> <p>▼ v1.19.15</p> <pre>## Changes * Bump postgresql from 13.14 to 13.15 (#1677) * Golang: Updated to v1.22.3. (#1668) ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2](https://github.com/onsi/ginkgo). * **net:** Updated to v0.25.0. For more information, see [net](https://github.com/golang/net). * **api:** Updated to v0.179.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> <p>▼ v1.19.14</p> <pre>## Changes * Bump ncurses from 6.4 to 6.5 (#1656) ## Dependencies * **v2:** Updated to v2.17.2. For more information, see [v2](https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.33.1. For more information, see [gomega](https://github.com/onsi/gomega). * **oauth2:** Updated to v0.20.0. For more information, see [oauth2](https://github.com/golang/oauth2). * **api:** Updated to v0.177.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| binary-offline-buildpack | 1.1.12  | <p>▼ 1.1.12</p> <pre>* Updating github-config * add codeowners (#173) * Uncached buildpack SHA256: 48e3f0980cb553 82272f9a1f0663d75040e4af799ba92e8469a178a3fe e6601 * Uncached buildpack SHA256: 200bab1ec9b36a 75dc79abac3a4c9c22a492893c42960c882a5b53c86b2 032fb * Uncached buildpack SHA256: a553f16f472801 2d86a652136aadaa74647b3a9797f1919ae8b0cc6bda6 623fe * Uncached buildpack SHA256: 753085c3118851 092f580125c938796fec87ccf88e155c61d5d9ecba53b c4c30</pre> |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| bpm                      | 1.2.19  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| capi                     | 1.182.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| cf-autoscaling           | 250.2.4 | <p>▼ v250.2.4</p> <pre>* Ensure Content-Length header is present on client credential grant requests to the UA A. Resolves incompatibility with some load balancers that will reject POST requests that do not provide a Content-Length header. The incompatibility was introduced in v250.1.3. * Bump dependencies</pre>                                                                                                                                                  |
| cf-cli                   | 1.60.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| cf-networking            | 3.46.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| cflinuxfs3               | 0.387.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cflinuxfs4       | 1.91.0         | <p>▼ v1.91.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.91.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.91.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.91.0</a>)</p> </div> <p>▼ v1.90.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.90.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.90.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.90.0</a>)</p> </div> <p>▼ v1.89.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.89.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.89.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.89.0</a>)</p> </div> <p>▼ v1.88.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.88.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.88.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.88.0</a>)</p> </div> <p>▼ v1.87.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.87.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.87.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.87.0</a>)</p> </div> <p>▼ v1.86.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.86.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.86.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.86.0</a>)</p> </div> <p>▼ v1.85.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.85.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.85.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.85.0</a>)</p> </div> |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                | <p>▼ v1.84.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.84.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.84.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.84.0</a>)</p> </div> <p>▼ v1.83.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.83.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.83.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.83.0</a>)</p> </div>                                                                                                                                                                                                                                                                                                                                                           |
| count-cores-indicator | 2.0.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| credhub               | 2.12.75        | <p>▼ 2.12.75</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Security Fixes * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.74...2.12.75">https://github.com/pivotal/credhub-release/compare/2.12.74...2.12.75</a></pre> </div> <p>▼ 2.12.74</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Security Fixes * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.73...2.12.74">https://github.com/pivotal/credhub-release/compare/2.12.73...2.12.74</a></pre> </div> <p>▼ 2.12.73</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre># What's Changed ## Security Fix * bump org.bouncycastle:bc-fips from 1.0.2.4 to 1.0.2.5 - this addresses CVE-2024-29857. **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.72...2.12.73">https://github.com/pivotal/credhub-release/compare/2.12.72...2.12.73</a></pre> </div> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.99.0  | <p>▼ v2.99.0</p> <pre> ## Changes - Do not remove evacuating actual LRP during cleanup ([rep#53] (https://github.com/cloudfoundry/rep/pull/53)) - Add additional retries when apps make use of credhub for credentials. ([buildpackapplifecycle#71] (https://github.com/cloudfoundry/buildpackapplifecycle/pull/71)) - Prevent panics in BBS by checking for all types of errors ([bbs#95] (https://github.com/cloudfoundry/bbs/pull/95)) - Add retry logic and more explicit failure in router emitter start-up ([router-emitter#34] (https://github.com/cloudfoundry/route-emitter/pull/34)) - Bump envoy blob version to `1.28.3` - Go mod dependency bumps ## Built with go 1.22.3 **Full Changelog**: https://github.com/cloudfoundry/diego-release/compare/v2.98.0...v2.99.0 ## Resources - [Download release 2.99.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.99.0). </pre> |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.28  | <p>▼ 2.4.28</p> <pre> * Add dotnet-runtime 6.0.30, remove dotnet- runtime 6.0.29 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-runtime 8.0.5, remove dotnet-r untime 8.0.4 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 6.0.422, remove dotnet-sdk 6.0.421 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 8.0.300, remove dotnet-sdk 8.0.204 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 7.0.409, remove dotnet-sdk 7.0.408 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 6.0.30, remove dotn et-aspnetcore 6.0.29 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 7.0.19, remove dotn et-aspnetcore 7.0.18 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 8.0.5, remove dotne t-aspnetcore 8.0.4 (#972) for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.30   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   7.0.19   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   8.0.5   cflinuxfs3, c flinuxfs4     dotnet-runtime   6.0.30   cflinuxfs3, cfl inuxfs4     dotnet-runtime   7.0.19   cflinuxfs3, cfl inuxfs4     dotnet-runtime   8.0.5   cflinuxfs3, cfl inuxfs4     dotnet-sdk   6.0.422   cflinuxfs3, cflinu xfs4     dotnet-sdk   7.0.409   cflinuxfs3, cflinu xfs4     dotnet-sdk   8.0.300   cflinuxfs3, cflinu xfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4   Default binary versions:</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>  name   version     -   -   dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 8c941c4f5e94f2 6a698251f43416b793c13d223f21778de7c4f25473502 2b0f5 * Uncached buildpack SHA256: 53b1022685fe33 4be0dac2b53b0d36d35f883e08154854194d6257f013a 04bae</pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.53.0  | <p>▼ v1.53.0</p> <pre> ## Changes - **DEPRECATION NOTICE** The `garden.experimental_use_containerd_mode_for_processes` property and usage of Garden when run in containerd mode for processes is now deprecated and no longer tested. - **DEFAULT CHANGE** - The default mode for garden containers is now containerd. This has been the default in cf-deployment since 2018. - **REMOVAL OF EXPERIMENTAL FUNCTIONALITY NOTICE** The experimental option to run the garden server process in rootless mode has been removed, as it did not work as expected and was an abandoned feature. - Go package dependency bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/garden-binaries/spec b/jobs/garden-binaries/spec index 0433639a..a8a96bae 100644 --- a/jobs/garden-binaries/spec +++ b/jobs/garden-binaries/spec @@ -15,7 +15,6 @@ packages: - grootfs - xfs-progs - thresholder - - netplugin-shim - dontpanic - tini diff --git a/jobs/garden/spec b/jobs/garden/spec index 027df351..093e53e1 100644 --- a/jobs/garden/spec +++ b/jobs/garden/spec @@ -36,7 +36,6 @@ packages: - grootfs - xfs-progs - thresholder - - netplugin-shim - dontpanic - tini @@ -199,10 +198,6 @@ properties: description: AppArmor profile to use for unprivileged container processes default: garden-default - garden.experimental_rootless_mode: -   description: A boolean stating whether or not to run garden-server as a non-root user -   default: false - # We believe this defaults to false to help concourse: https://github.com/cloudfoundry/garden-runc-release/releases/tag/v1.5.0 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> # For diego/cf, this should be set to true garden.cleanup_process_dirs_on_wait: @@ -210,8 +205,8 @@ properties: default: false garden.containerd_mode: -   description: "Use containerd for container lifecycle management. NOTE: cannot be used in combination with bpm or rootless" -   default: false +   description: "Use containerd for container lifecycle management. NOTE: cannot be used in combination with bpm" +   default: true garden.tcp_keepalive_time: description: Sets the `net.ipv4.tcp_keepalive_time` kernel parameter in containers. If not specified, the value from the linux init_net namespace is used. @@ -229,7 +224,7 @@ properties: description: Sets the `net.ipv4.tcp_retries_2` kernel parameter in containers. If not specified, the value from the linux init_net namespace is used. garden.experimental_use_containerd_mode_for_processes: -   description: "(Under development) Use containerd for container process management. Must be used with containerd_mode also set to true. NOTE: cannot be used in combination with bpm or rootless" +   description: "(Deprecated) No longer used/tested." default: false garden.experimental_cpu_throttling: diff --git a/jobs/gats/spec b/jobs/gats/spec c index 916a35eb..065e3ace 100644 --- a/jobs/gats/spec +++ b/jobs/gats/spec @@ -22,12 +22,6 @@ properties: garden_test_rootfs: description: Test rootfs to use default: 'docker:///cloudfoundry/garden-rootfs' -   containerd_for_processes: -   description: Run GATS with CONTAINERD_FOR PROCESSES ENABLED -   default: false -   rootless: -   description: Run GATS with ROOTLESS env var -   default: false cpu_throttling: description: Run GATS with CPU THROTTLING ENABLED default: false ``` </pre> |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |         | <pre>## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.52.0...v1.53.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.52.0...v1.53.0</a> ## Resources - [Download release 1.53.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.53.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.53.0</a>).</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| go-offline-buildpack            | 1.10.19 | <p>▼ 1.10.19</p> <pre>* Updating github-config * Add go 1.22.3, remove go 1.22.2 (#446) for stack(s) cflinuxfs3, cflinuxfs4 (<a href="https://www.pivotaltracker.com/story/show/187563910">https://www.pivotaltracker.com/story/show/187563910</a>) * Add go 1.21.10, remove go 1.21.9 (#447) for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187563965">https://www.pivotaltracker.com/story/show/187563965</a>)   name   version   cf_stacks    - - -   dep   0.5.4   cflinuxfs3     dep   0.5.4   cflinuxfs4     glide   0.13.3   cflinuxfs3     glide   0.13.3   cflinuxfs4     go   1.21.10   cflinuxfs3     go   1.21.10   cflinuxfs4     go   1.22.3   cflinuxfs3     go   1.22.3   cflinuxfs4     godep   80   cflinuxfs3     godep   80   cflinuxfs4   Default binary versions:   name   version    - -    go   1.21.x   * Uncached buildpack SHA256: 01b9a7ec000681208f9b1f11a9c4ae92b2c284f8b07b847856bae56d398bf996 * Uncached buildpack SHA256: 6d51853911899b58554327ff01c4cf9b0d97ac7e849e6038b010d1b515ff47f6</pre> |
| java-offline-buildpack          | 4.69.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| java-native-image-cnb-buildpack | 0.10.4  | <p>▼ 0.10.4</p> <pre>Components: * [buildpack v0.12.4] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.4">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.4</a>)</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component         | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache         | 3.0.12   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| loggregator       | 107.0.14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| loggregator-agent | 8.1.1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| mapfs             | 1.2.70   | <p>▼ v1.2.70</p> <pre>## Changes * Golang: Updated to v1.22.3. (#259) ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2] (https://github.com/onsi/ginkgo). * **mapfs:** Updated to v`0de16f2`. For more information, see [mapfs] (https://github.com/cloudfoundry/mapfs).</pre> <p>▼ v1.2.69</p> <pre>## Dependencies * **v2:** Updated to v2.17.2. For more information, see [v2] (https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.33.1. For more information, see [gomega] (https://github.com/onsi/gomega). * **mapfs:** Updated to v`7f382bc`. For more information, see [mapfs] (https://github.com/cloudfoundry/mapfs).</pre> |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| metric-registrar | 4.0.0   | <p>▼ v4.0.0</p> <pre>## What's Changed * feat: Discover binding URLs from Binding Cache by @ctlong in https://github.com/pivotal-cf/metric-registrar-release/pull/485 * delete unused uaa properties by @mkocher in https://github.com/pivotal-cf/metric-registrar-release/pull/487 **Full Changelog**: https://github.com/pivotal-cf/metric-registrar-release/compare/v3.0...v4.0.0</pre> |
|                  |         | <p>▼ v3.0.3</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9] (https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ) **Full Changelog**: https://github.com/pivotal-cf/metric-registrar-release/compare/v3.0...v3.0.3</pre>                                                                                                                          |
|                  |         | <p>▼ v3.0.2</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.8] (https://groups.google.com/g/golang-announce/c/5pwGVUPoMbg/m/46oA5yPABQAJ) **Full Changelog**: https://github.com/pivotal-cf/metric-registrar-release/compare/v3.0...v3.0.2</pre>                                                                                                                          |
|                  |         | <p>▼ v3.0.1</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.6 **Full Changelog**: https://github.com/pivotal-cf/metric-registrar-release/compare/v3.0...v3.0.1</pre>                                                                                                                                                                                       |
|                  |         | <p>▼ v3.0.0</p> <pre>## What's Changed * feat(orchestrator): Update to use CAPI internal API v5 https://github.com/pivotal-cf/metric-registrar-release/pull/340 * bump dependencies **Full Changelog**: https://github.com/pivo</pre>                                                                                                                                                      |

| Component        | Version | Release Notes                                                                                |
|------------------|---------|----------------------------------------------------------------------------------------------|
|                  |         | <p><a href="#">tal-cf/metric-registrar-release/compare/v2.1.11...v3.0.0</a></p>              |
| mysql-monitoring | 10.15.0 | <p>▼ v10.15.0</p> <ul style="list-style-type: none"><li>- Updates golang to 1.22.3</li></ul> |
| nats             | 56.19.0 |                                                                                              |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume              | 7.1.66  | <p>▼ v7.1.66</p> <pre> ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **nfsbroker:** Updated to v`90964d1`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>). * **nfsv3driver:** Updated to v`4d13326`. For more information, see [nfsv3driver] (<a href="https://github.com/cloudfoundry/nfsv3driver">https://github.com/cloudfoundry/nfsv3driver</a>). </pre> <p>▼ v7.1.65</p> <pre> ## Changes * Golang: Updated to v1.22.3 (#920) * Bump util-linux from 2.40 to 2.40.1 (#922) * Change nfsv3driver statd default port to `41793` (non-ephemeral) (#909) * Use newest cf-cli available (#913) ## Dependencies * **nfsbroker:** Updated to v`071d3d8`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>). * **nfsv3driver:** Updated to v`49ad37b`. For more information, see [nfsv3driver] (<a href="https://github.com/cloudfoundry/nfsv3driver">https://github.com/cloudfoundry/nfsv3driver</a>). </pre> <p>▼ v7.1.64</p> <pre> ## Dependencies * **gomega:** Updated to v1.33.1. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>). * **nfsbroker:** Updated to v`33b1b44`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>). * **nfsv3driver:** Updated to v`2e98b36`. For more information, see [nfsv3driver] (<a href="https://github.com/cloudfoundry/nfsv3driver">https://github.com/cloudfoundry/nfsv3driver</a>). </pre> |
| nginx-offline-buildpack | 1.2.14  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.25  | <p>▼ 1.8.25</p> <pre> * Add node 18.20.3, remove node 18.19.1 for stack(s) cflinuxfs3, cflinuxfs4 (<a href="https://www.pivotaltracker.com/story/show/187642410">https://www.pivotaltracker.com/story/show/187642410</a>) * Add node 20.13.1, remove node 20.11.1 (#722) for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187563723">https://www.pivotaltracker.com/story/show/187563723</a>)   name   version   cf_stacks    - -    node   18.20.2   cflinuxfs3     node   18.20.2   cflinuxfs4     node   18.20.3   cflinuxfs3     node   18.20.3   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4     node   20.13.1   cflinuxfs3     node   20.13.1   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: 725a6a0a45207f1469a6a146883aeccacff70ab2dde4d3c6c68fc98fe86199c9 * Uncached buildpack SHA256: 85d4df7c4d322005d6730a04245fcf18eb5742ae36523f35598f9f229c20f29a </pre> |
| notifications            | 70.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| notifications-ui         | 47.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| otel-collector           | 0.4.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.19  | <p>▼ 4.6.19</p> <pre>* Add php 8.3.7, remove php 8.3.4 (#1047) for stack(s) cflinuxfs4, cflinuxfs3 * Add composer 2.7.6, remove composer 2.7.5 (#1044) for stack(s) cflinuxfs4, cflinuxfs3 * Add php 8.2.19, remove php 8.2.17 (#1045) for stack(s) cflinuxfs4, cflinuxfs3 * Add composer 2.7.5, remove composer 2.7.4 (#1043) for stack(s) cflinuxfs4, cflinuxfs3 * Update default nginx version * Add nginx 1.25.5, remove nginx 1.25.4 (#1036) * Add nginx 1.26.0 for stack(s) cflinuxfs4, cflinuxfs3 * Rebuild php 8.2.18 for stack(s) cflinuxfs4, cflinuxfs3 * Add composer 2.7.4, remove composer 2.7.3 (#1034) for stack(s) cflinuxfs4, cflinuxfs3 * Add composer 2.7.3, remove composer 2.7.2 (#1033) for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks   modules    - - -    appdynamics   23.11.0-839   cflinuxfs3, cflinuxfs4       composer   2.7.6   cflinuxfs3, cflinuxfs4       httpd   2.4.59   cflinuxfs3       httpd   2.4.59   cflinuxfs4       newrelic   10.11.0.3   cflinuxfs3, cflinuxfs4       nginx   1.25.5   cflinuxfs3       nginx   1.25.5   cflinuxfs4       nginx   1.26.0   cflinuxfs3       nginx   1.26.0   cflinuxfs4       php   8.1.26   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.26   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib  </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib      php   8.1.27   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib      php   8.1.27   cflinuxfs4   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, z lib      php   8.2.18   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib      php   8.2.18   cflinuxfs4   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io ncube, ldap, lzf, mailparse, maxminddb, mbstr ing, memcached, mongodb, msgpack, mysqli, oau th, opcache, openssl, pcntl, pdo, pdo_firebir d, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlit e, pdo_sqlsrv, pgsql, phalcon, phpiredis, psp ell, psr, rdkafka, readline, redis, shmop, sn mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib      php   8.2.19   cflinuxfs3   amqp, apcu, b z2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, io </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <p>ncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib   php   8.2.19   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib   php   8.3.6   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib   php   8.3.6   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib   php   8.3.7   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> |  |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |          | <pre>   php   8.3.7   cflinuxfs4   amqp, apcu, bz 2, curl, dba, enchant, exif, fileinfo, ftp, g d, gettext, gmp, igbinary, imagick, imap, lda p, lzf, mailparse, maxminddb, mbstring, memca ched, mongodb, msgpack, mysqli, oauth, opcache e, openssl, pcntl, pdo, pdo_firebird, pdo_my sql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sq lrv, pgsql, phalcon, phpiredis, pspell, psr, r dkafka, readline, redis, shmop, snmp, soap, s ockets, sodium, solr, sqlsrv, ssh2, stomp, sy svmsg, sysvsem, sysvshm, tideways_xhprof, tid y, xdebug, xsl, yaml, zip, zlib     python   2.7.18   cflinuxfs4       ruby   3.0.5   cflinuxfs4     Default binary versions:   name   version    - -    php   8.1.27     httpd   2.4.59     newrelic   10.11.0.3     nginx   1.26.0     composer   2.7.6   * Uncached buildpack SHA256: balf163a508749 79ee5bd6dabd5ea95c30e59fe0beb23544ca0d949fdac ae635 * Uncached buildpack SHA256: 11f5e960ee8c95 3802cc3112c390abb0caa972b0967c6885aaf557bd421 9f15f </pre> |
| push-apps-manager-release | 677.0.45 | <p>▼ 677.0.45</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre> ## What's Changed fix http:414 caused by customers with more than 200 routes. This fix is for the service binding pages. </pre> </div> <p>▼ 677.0.44</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre> * update dependencies </pre> </div> <p>▼ 677.0.43</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre> * Add doc link to autoscaler rule add/edit flyout * Change default threshold for CPU Entitlement rules in App Autoscaling * Fix issue with self hosted service_instances affecting the service instance quota in a pps man header * Make the documentation clearer for airgap ped/non-airgapped environments </pre> </div>                                                                                                                                                                                                                                                     |

| Component                  | Version   | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-offline-docs-release  | 6.0.169   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| push-usage-service-release | 674.0.101 | <p>▼ v674.0.101</p> <pre>## Dependencies * **app-usage-service:** Updated to v`0b882d3`.<br/> For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> <p>▼ v674.0.100</p> <pre>## Changes * Avoid leaking creds from env var if possible (#578) ## Dependencies * **app-usage-service:** Updated to v`e850c40`.<br/> For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> <p>▼ v674.0.99</p> <pre>## Dependencies * **app-usage-service:** Updated to v`9d527f6`.<br/> For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> |
| pxc                        | 1.0.28    | <p>▼ v1.0.28</p> <pre>**Dependency bumps** - Updates golang to 1.22.3</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.25  | <p>▼ 1.8.25</p> <pre>* Add miniconda3-py39 24.4.0, remove miniconda3-py39 24.3.0 (#917) for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187637426">https://www.pivotaltracker.com/story/show/187637426</a>) * Add setuptools 70.0.0, remove setuptools 69.5.1 (#918) for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187641872">https://www.pivotaltracker.com/story/show/187641872</a>) * Add miniconda3-py39 24.3.0, remove miniconda3-py39 24.1.2 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187433355">https://www.pivotaltracker.com/story/show/187433355</a>)   name   version   cf_stacks    - - -   libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniconda3-py39   24.4.0   cflinuxfs3, cflinuxfs4     pip   24.0   cflinuxfs3, cflinuxfs4     pipenv   2023.12.1   cflinuxfs3     pipenv   2023.12.1   cflinuxfs4     python   3.8.19   cflinuxfs3     python   3.8.19   cflinuxfs4     python   3.9.19   cflinuxfs3     python   3.9.19   cflinuxfs4     python   3.10.14   cflinuxfs3     python   3.10.14   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     python   3.12.3   cflinuxfs3     python   3.12.3   cflinuxfs4     setuptools   70.0.0   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    python   3.10.x   * Uncached buildpack SHA256: 5c5ce4eb1a7f3784963234075467784df417b8fd92fe6d0c5ad77d1829f9025e * Uncached buildpack SHA256: 0cb3bac356825d8220fa522bdb6bb7ce3ef682b6cc974346da9b3c75778a5ac3</pre> |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| r-offline-buildpack | 1.2.12  | <p>▼ 1.2.12</p> <pre>* Remove R 3.6 (old version) * Add r 4.4.0 for stack(s) cflinuxfs3, cflinuxfs4 with dependencies for stack cflinuxfs3: for ecast 8.22.0, plumber 1.2.2, rserve 1.8.13, shiny 1.8.1.1 with dependencies for stack cflinuxfs4: for ecast 8.22.0, plumber 1.2.2, rserve 1.8.13, shiny 1.8.1.1   name   version   cf_stacks   modules    - - -    r   4.2.3   cflinuxfs3   forecast, plumber, rserve, shiny     r   4.2.3   cflinuxfs4   forecast, plumber, rserve, shiny     r   4.3.3   cflinuxfs3   forecast, plumber, rserve, shiny     r   4.3.3   cflinuxfs4   forecast, plumber, rserve, shiny     r   4.4.0   cflinuxfs3   forecast, plumber, rserve, shiny     r   4.4.0   cflinuxfs4   forecast, plumber, rserve, shiny   * Uncached buildpack SHA256: c2bfdb323e374eec2f7306d9f97393d017a6cc176568a29e4a7aef6125a1efb1 * Uncached buildpack SHA256: 33b434519fa21656243a448f40d368c93d5498a8528d1331fb9beb85f1d1c76e</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.298.0 | <p>▼ v0.298.0</p> <pre> ## Changes - :bug: Improve support for requests using the Expect: 100-continue header. - :bug: The missing_content_length_header m etric introduced in 0.297.0 has been renamed to empty_content_length_header for more accur acy. Thanks @peanball! - :bug: The empty_content_length_header was fixed to more accurately capture events when the content-length header of a request was em pty. Previously extra request types were bein g included erroneously.  ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/goro uter/spec index 712a761f..8269440b 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -306,6 +306,9 @@ properties: router.keep_alive_probe_interval: default: 1s description: Interval between TCP keep aliv e probes. Value is a string (e.g. "10s") + router.keep_alive_100_continue_requests: +   description: "If set gorouter reuses b ackend connection for requests expecting 100- Continue" +   default: false router.force_forwarded_proto_https: description: "Enables setting X-Forwarded-P roto header if SSL termination happened upstr eam and incorrectly set the header value. Whe n this property is set to true gorouter sets the header X-Forwarded-Proto to https. When t his value set to false, gorouter set the head er X-Forwarded-Proto to the protocol of the i ncoming request" default: false ``` ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.297.0...v0.298.0">https://github.com/cloudfoundry/routing-release/compare/v0.297.0...v0.298.0</a> ## Resources - [Download release 0.298.0 from bosh.io](h ttps://bosh.io/releases/github.com/cloudfound ry/routing-release?version=0.298.0). </pre> <p>▼ v0.297.0</p> <pre> ## Changes - ** FIXES KNOWN ISSUE** Gorouter now corre ctly returns the status code provided by back </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ends for workflows using 100-continue, or other 1xx interim status codes. Thanks for catching this @plowin @domdom82 and thanks @geofffranks for the quick fix!</p> <ul style="list-style-type: none"> <li>- The TLS listener for the health status endpoint in gorouter now handles custom cipher-suites that do not include any of the required HTTP/2 ciphers. Thanks @MarcPaquette + @geofffranks!</li> <li>- Failing to establish a TCP connection to a backend no longer causes a panic when setting up a WebSocket connection. Thanks @domdom82!</li> <li>- The health status endpoint for gorouter is now able to log error messages encountered when it starts up, to aid in troubleshooting. Thanks @MarcPaquette and @geofffranks !</li> <li>- Gorouter now provides a `missing_content_length_header` metric that will flag requests that would have been hit by Golang 1.22's new check to reject requests that have an empty content-length header. This can be used to determine if an environment will be affected by disabling the `go.httpallowcontentlength` gorouter property. Thanks @mariash!</li> <li>- **NOTE:** The metric is counting requests unaffected by the new golang behavior and will be updated in 0.298.0+, where it is also renamed to `empty_content_length_header`.</li> <li>- Route registrar now allows operators to specify load balancing algorithms for individual routes. Thanks @bltamara and @domdom82 !</li> <li>- Bumped to golang 1.22.3</li> </ul> <pre>## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index c51dbb9f..de81a0e8 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -125,7 +125,8 @@ properties: with error, the route is unregistered.   router_group (required, string, for tcp routes): Name of the router group to which the TCP route should be added.   external_port (required, string, for tcp routes): Port that the TCP router will listen on. -          server_cert_domain_name_modifier (optional, string, for sni routes): a regex replace to help with complicated hostnames +          server_cert_domain_name_modifier (optional, string, for sni routes): a regex replace to help with complicated hostnames. +          options (optional, object, for http routes): Custom per-route options   health_check object</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> name (required, string): Human-readable reference for the healthcheck @@ -135,6 +136,9 @@ properties: the script is terminated with `SIGKILL` and the route is unregistered. Value is a string (e.g. "10s") and must parse to a positive time duration i.e. "-5s" is not permitted. Must be less than the value of `registration_interval`.  Default: Half of the value of `registration_interval` + options object + lb_algo (optional, string): Load balancing algorithm for routing incoming requests to the backend: 'round-robin' or 'least-connection'. In cases where this option is not specified, the algorithm defined in gorouter spec is applied. + example:   - name: my-service uris: @@ -150,6 +154,8 @@ properties: script_path: /path/to/script timeout: 5s route_service_url: https://my-oauth-proxy-route-service.example.com + options: + lb_algo: least-connection - name: my-tls-endpoint tls_port: 12346 server_cert_domain_san: "my-tls-endpoint.internal.com" ``` ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.296.0...v0.297.0">https://github.com/cloudfoundry/routing-release/compare/v0.296.0...v0.297.0</a> ## Resources - [Download release 0.297.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.297.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.297.0</a>).</pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack | 1.10.15 | <p>▼ 1.10.15</p> <pre>* Add jruby 9.4.7.0, remove jruby 9.4.6.0 (#939) for stack(s) cflinuxfs4, cflinuxfs3 * Add bundler 2.5.10, remove bundler 2.5.9 (#941) for stack(s) cflinuxfs4, cflinuxfs3 * Add rubygems 3.5.10, remove rubygems 3.5.9 (#942) for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - -    bundler   2.5.10   cflinuxfs3, cflinuxfs4     jruby   9.4.7.0   cflinuxfs3     jruby   9.4.7.0   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.4   cflinuxfs3     ruby   3.1.4   cflinuxfs4     ruby   3.1.5   cflinuxfs3     ruby   3.1.5   cflinuxfs4     ruby   3.2.2   cflinuxfs3     ruby   3.2.2   cflinuxfs4     ruby   3.2.3   cflinuxfs3     ruby   3.2.3   cflinuxfs4     ruby   3.2.4   cflinuxfs3     ruby   3.2.4   cflinuxfs4     ruby   3.3.0   cflinuxfs3     ruby   3.3.0   cflinuxfs4     ruby   3.3.1   cflinuxfs3     ruby   3.3.1   cflinuxfs4     rubygems   3.5.10   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    ruby   3.2.x   * Uncached buildpack SHA256: 7a017a3df73e6142992e55c7a6f9d906199fc57d7dbb2e8a04a73fc86e159221 * Uncached buildpack SHA256: c6ec2510015faf48b68f5026e4a7f5421bbd3e8a35fec342a89adfa3df753950</pre> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| web-servers-cnb-buildpack | 0.13.2  | <p>▼ 0.13.2</p> <div style="border: 1px solid #ccc; padding: 10px;"> <b>Components:</b> <ul style="list-style-type: none"> <li>* [buildpack v0.16.1] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.1">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.1</a>)</li> </ul> </div> <p>▼ 0.13.1</p> <div style="border: 1px solid #ccc; padding: 10px;"> <b>Components:</b> <ul style="list-style-type: none"> <li>* [buildpack v0.16.1] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.1">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.1</a>)</li> </ul> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| silk                      | 3.46.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| smb-volume                | 3.1.68  | <p>▼ v3.1.68</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Golang: Updated to v1.22.3 (#408) ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **smbbroker:** Updated to v`17a844f`. For more information, see [smbbroker] (<a href="https://github.com/cloudfoundry/smbbroker">https://github.com/cloudfoundry/smbbroker</a>). * **smbdriver:** Updated to v`9ccf77c`. For more information, see [smbdriver] (<a href="https://github.com/cloudfoundry/smbdriver">https://github.com/cloudfoundry/smbdriver</a>).</pre> </div> <p>▼ v3.1.67</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Use newest cf-cli available (#405) ## Dependencies * **v2:** Updated to v2.17.2. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **gomega:** Updated to v1.33.1. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>). * **smbbroker:** Updated to v`490615c`. For more information, see [smbbroker] (<a href="https://github.com/cloudfoundry/smbbroker">https://github.com/cloudfoundry/smbbroker</a>). * **smbdriver:** Updated to v`fa2b5d0`. For more information, see [smbdriver] (<a href="https://github.com/cloudfoundry/smbdriver">https://github.com/cloudfoundry/smbdriver</a>).</pre> </div> |
| smoke-tests               | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.13  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| statsd-injector              | 1.11.40 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| syslog                       | 12.2.5  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| system-metrics-scraper       | 4.0.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| uaa                          | 77.9.0  | <p>▼ v77.9.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.9.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.9.0) ### Misc * fix: update java version by @Tallicia in https://github.com/cloudfoundry/uaa-release/pull/861 * fix issue #856 by @strehle in https://github.com/cloudfoundry/uaa-release/pull/857 ### Dependency Bumps * [Upgrade Tomcat to version 9.0.89] (https://github.com/cloudfoundry/uaa-release/commit/153829329852ed06f65b62ead33651962510063b) * Bump github.com/cloudfoundry/bosh-utils from 0.0.459 to 0.0.461 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/864 * Bump i18n from 1.14.4 to 1.14.5 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/866 * Bump BigDecimal from 3.1.7 to 3.1.8 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/867 * Bump github.com/cloudfoundry/bosh-utils from 0.0.461 to 0.0.463 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/869 * Bump rspec-mocks from 3.13.0 to 3.13.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/870 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.8.0...v77.9.0 </pre> |
| tanzu-jammy-stack            | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## 6.0.3

**Release Date:** 05/03/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To

resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue.](#)

- **[Bug Fix]** Reduce load on Cloud Controller from syslog drain fetching in Syslog Binding Cache and Metric Registrar. In certain instances Cloud Controllers may become unresponsive without this bug fix if they can not handle the load
- **[Bug Fix]** In certain instances Cloud Controllers may become unresponsive because of the load generated by metric-registrar 3.0.0-3.0.3. Rolling back to 2.1.14 will not have any user visible effects and will reduce the load on Cloud Controller substantially.
- Bump loggregator-agent to version [8.1.1](#)
- Bump metric-registrar to version [2.1.14](#)
- Bump mysql-monitoring to version [10.14.0](#)
- Bump nginx-offline-buildpack to version [1.2.14](#)
- Bump ruby-offline-buildpack to version [1.10.14](#)
- Bump staticfile-offline-buildpack to version [1.6.13](#)
- Bump uaa to version [77.8.0](#)

| Component                     | Version | Release Notes |
|-------------------------------|---------|---------------|
| ubuntu-jammy stemcell         | 1.423   |               |
| backup-and-restore-sdk        | 1.19.12 |               |
| binary-offline-buildpack      | 1.1.11  |               |
| bosh-dns-aliases              | 0.0.4   |               |
| bpm                           | 1.2.18  |               |
| capi                          | 1.180.0 |               |
| cf-autoscaling                | 250.2.3 |               |
| cf-cli                        | 1.60.0  |               |
| cf-networking                 | 3.46.0  |               |
| cflinuxfs3                    | 0.387.0 |               |
| cflinuxfs4                    | 1.82.0  |               |
| count-cores-indicator         | 2.0.0   |               |
| credhub                       | 2.12.72 |               |
| diego                         | 2.98.0  |               |
| dotnet-core-offline-buildpack | 2.4.27  |               |
| garden-runc                   | 1.52.0  |               |
| go-offline-buildpack          | 1.10.18 |               |
| java-offline-buildpack        | 4.68.0  |               |

| Component                       | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| java-native-image-cnb-buildpack | 0.10.3   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| log-cache                       | 3.0.12   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| loggregator                     | 107.0.14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| loggregator-agent               | 8.1.1    | <p>▼ v8.1.1</p> <pre>## What's Changed * Bump dependencies * Fix Syslog Binding Cache polling to wait for the entire polling interval between each operation in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/572">https://github.com/cloudfoundry/loggregator-agent-release/pull/572</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.0...v8.1.1">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.0...v8.1.1</a></pre> |
| mapfs                           | 1.2.68   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| metric-registrar                | 2.1.14   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| mysql-monitoring                | 10.14.0  | <p>▼ v10.14.0</p> <pre>- Removing indicator protocol - Dependency bumps</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| nats                            | 56.19.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| nfs-volume                      | 7.1.63   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component                  | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack    | 1.2.14   | <p>▼ 1.2.14</p> <pre>* Add nginx 1.26.0, remove nginx 1.24.0 for stack(s) cflinuxfs3, cflinuxfs4 (<a href="https://www.pivotaltracker.com/story/show/187519044">https://www.pivotaltracker.com/story/show/187519044</a>) * Add nginx 1.25.5, remove nginx 1.25.4 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187441840">https://www.pivotaltracker.com/story/show/187441840</a>)   name   version   cf_stacks    - - -   nginx   1.25.5   cflinuxfs3     nginx   1.25.5   cflinuxfs4     nginx   1.26.0   cflinuxfs3     nginx   1.26.0   cflinuxfs4     openresty   1.21.4.2   cflinuxfs3     openresty   1.21.4.2   cflinuxfs4     openresty   1.25.3.1   cflinuxfs3     openresty   1.25.3.1   cflinuxfs4   Default binary versions:   name   version    - -   nginx   1.25.x   * Uncached buildpack SHA256: ba7b84c47b0dae 826bb0b29d4013843b74e2dfbaf9096a896bd122c6ee0 4b780 * Uncached buildpack SHA256: 65aa6409a9972b 8741989cf7da65b7bff4a93057b5e375b4f802e4910bf 923ba</pre> |
| nodejs-offline-buildpack   | 1.8.24   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| notifications              | 70.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| notifications-ui           | 47.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| otel-collector             | 0.4.1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| php-offline-buildpack      | 4.6.18   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| push-apps-manager-release  | 677.0.42 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| push-offline-docs-release  | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| push-usage-service-release | 674.0.98 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| pxc                        | 1.0.27   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| python-offline-buildpack   | 1.8.23   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| r-offline-buildpack        | 1.2.11   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| routing                    | 0.296.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack    | 1.10.14 | <p>▼ 1.10.14</p> <pre>* Add ruby 3.3.1 for stack(s) cflinuxfs4, cflinuxfs3 * Add ruby 3.2.4, remove ruby 3.2.2 (#936) for stack(s) cflinuxfs4, cflinuxfs3 [#18750 0229] * Add ruby 3.1.5, remove ruby 3.1.3 (#938) for stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - - -   bundler   2.5.9   cflinuxfs3, cflinuxfs4     jruby   9.4.6.0   cflinuxfs3     jruby   9.4.6.0   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, c flinuxfs4     ruby   3.1.4   cflinuxfs3     ruby   3.1.4   cflinuxfs4     ruby   3.1.5   cflinuxfs3     ruby   3.1.5   cflinuxfs4     ruby   3.2.2   cflinuxfs3     ruby   3.2.2   cflinuxfs4     ruby   3.2.3   cflinuxfs3     ruby   3.2.3   cflinuxfs4     ruby   3.2.4   cflinuxfs3     ruby   3.2.4   cflinuxfs4     ruby   3.3.0   cflinuxfs3     ruby   3.3.0   cflinuxfs4     ruby   3.3.1   cflinuxfs3     ruby   3.3.1   cflinuxfs4     rubygems   3.5.9   cflinuxfs3, cflinuxfs4     yarn   1.22.22   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    ruby   3.2.x   * Uncached buildpack SHA256: 7bd144c9f55ac9 e90d05ca43af8359923ade9de084c87f280560af3deb0 77307 * Uncached buildpack SHA256: 008265316f8b74 a066e5a5198c39a75b78514c7b458952f151fc52c858d 079ff</pre> |
| web-servers-cnb-buildpack | 0.13.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| silk                      | 3.46.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| smb-volume                | 3.1.66  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| smoke-tests               | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.13  | <p>▼ 1.6.13</p> <pre>* Add nginx 1.26.0, remove 1.24.0 for stack(s) cflinuxfs3, cflinuxfs4 (<a href="https://www.pivotaltracker.com/story/show/187519048">https://www.pivotaltracker.com/story/show/187519048</a>) * Add nginx 1.25.5, remove nginx 1.25.4 for stack(s) cflinuxfs4, cflinuxfs3 (<a href="https://www.pivotaltracker.com/story/show/187441964">https://www.pivotaltracker.com/story/show/187441964</a>) * add codeowners (#418)   name   version   cf_stacks    - - -    nginx   1.25.5   cflinuxfs3     nginx   1.25.5   cflinuxfs4     nginx   1.26.0   cflinuxfs3     nginx   1.26.0   cflinuxfs4   Default binary versions:   name   version    - -    nginx   1.25.x   * Uncached buildpack SHA256: 4ab6f2a4d8f132e0a07451ef6eff3c138e08990b1de36b5bb6d5c9630f3fe192 * Uncached buildpack SHA256: d8d6617a7c62b626309260dd455720b227d7e1487bed54a7d6d56aad2251106e</pre> |
| statsd-injector              | 1.11.40 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| syslog                       | 12.2.5  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| system-metrics-scraper       | 4.0.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa               | 77.8.0  | <p>▼ v77.8.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.8.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.8.0) ### Misc * fix: MySQL Performance Issues in "/ids/Users" Endpoint - [Set DB case-insensitivity flag in SimpleSearchQueryConverter] (https://github.com/cloudfoundry/uaa/commit/38a2048f7285850cc5e1cb8bd996175b9b76c185) ### Dependency Bumps * Bump github.com/onsi/gomega from 1.33.0 to 1.33.1 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/860 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.7.0...v77.8.0 </pre> |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## 6.0.2

**Release Date:** 05/01/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue](#).

- **[Bug fix]** Fixed a database performance problem for UAA using MySQL with a large number of users
- Bump backup-and-restore-sdk to version [1.19.12](#)
- Bump binary-offline-buildpack to version [1.1.11](#)
- Bump capi to version [1.180.0](#)
- Bump cf-autoscaling to version [250.2.3](#)
- Bump cf-networking to version [3.46.0](#)
- Bump credhub to version [2.12.72](#)
- Bump diego to version [2.98.0](#)
- Bump dotnet-core-offline-buildpack to version [2.4.27](#)
- Bump garden-runc to version [1.52.0](#)

- Bump go-offline-buildpack to version 1.10.18
- Bump java-offline-buildpack to version 4.68.0
- Bump java-native-image-cnb-buildpack to version 0.10.3
- Bump loggregator-agent to version 8.1.0
- Bump mapfs to version 1.2.68
- Bump nats to version 56.19.0
- Bump nfs-volume to version 7.1.63
- Bump nginx-offline-buildpack to version 1.2.13
- Bump nodejs-offline-buildpack to version 1.8.24
- Bump notifications to version 70.0.0
- Bump php-offline-buildpack to version 4.6.18
- Bump push-usage-service-release to version 674.0.98
- Bump pxc to version 1.0.27
- Bump python-offline-buildpack to version 1.8.23
- Bump r-offline-buildpack to version 1.2.11
- Bump routing to version 0.296.0
- Bump ruby-offline-buildpack to version 1.10.13
- Bump web-servers-cnb-buildpack to version 0.13.0
- Bump silk to version 3.46.0
- Bump smb-volume to version 3.1.66
- Bump staticfile-offline-buildpack to version 1.6.12
- Bump syslog to version 12.2.5
- Bump uaa to version 77.7.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.423   |               |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| backup-and-restore-sdk   | 1.19.12 | <p>▼ v1.19.12</p> <pre>## Dependencies * **gomega:** Updated to v1.33.0. For more information, see [gomega](https://github.com/onsi/gomega). * **net:** Updated to v0.23.0. For more information, see [net](https://github.com/golang/net). * **api:** Updated to v0.175.0. For more information, see [api](https://github.com/googleapis/google-api-go-client).</pre> <p>▼ v1.19.11</p> <pre>## Dependencies * **azblob:** Updated to v1.3.2. For more information, see [azblob](https://github.com/Azure/azure-sdk-for-go). * **bosh-backup-and-restore:** Updated to v1.9.63. For more information, see [bosh-backup-and-restore](https://github.com/cloudfoundry-incubator/bosh-backup-and-restore).</pre> |
| binary-offline-buildpack | 1.1.11  | <p>▼ 1.1.11</p> <pre>* Updating github-config (#171) * Uncached buildpack SHA256: 2fdf5a579b79fd f13f372e3f5b4b629e9aae874ce6f0dd2c45e40677ca0 cfab8 * Uncached buildpack SHA256: 7ed9c48549bde1 98c89f9f30a0d41f15a2d210a2c64762bd5fb5aa72a8b 0d7d6 * Uncached buildpack SHA256: bb0ef600ab0f00 7d47e0094289529cc2a5c8e35ad0c870aeee97e23bcbb 9bd08 * Uncached buildpack SHA256: 0178f96db779db 196fd56d031ff87116af8f2f8d1bfcd82c563317ffelf f2d13</pre>                                                                                                                                                                                                                                                     |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| bpm                      | 1.2.18  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| capi                     | 1.180.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-autoscaling        | 250.2.3 | <p>▼ v250.2.3</p> <pre>## What's Changed * Bump dependencies</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| cf-cli                | 1.60.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cf-networking         | 3.46.0  | <p>▼ v3.46.0</p> <pre>## Changes - Bump Golang to 1.22 ## Bosh Job Spec changes: ```diff diff --git a/jobs/performance-test-sd/spec b/jobs/performance-test-sd/spec index c89d50f5..0583340e 100644 --- a/jobs/performance-test-sd/spec +++ b/jobs/performance-test-sd/spec @@ -6,7 +6,7 @@ templates: config.json.erb: config.json packages: - - golang-1.21-linux + - golang-1.22-linux - performance-test-sd consumes: ``` ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.45.0...v3.46.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.45.0...v3.46.0</a> ## Resources - [Download release 3.46.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.46.0).</pre> |
| cflinuxfs3            | 0.387.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cflinuxfs4            | 1.82.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| credhub   | 2.12.72 | <p>▼ 2.12.72</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>Various dependency security bumps</pre> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|           |         | <p>▼ 2.12.71</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Security Fixes * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.70...2.12.71">https://github.com/pivotal/credhub-release/compare/2.12.70...2.12.71</a></pre> </div>                                                                                                                                                                                                                                                                                                                                                                 |
|           |         | <p>▼ 2.12.70</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre># What's Changed ## Bug Fixes * Fixed issue #231 [CredHub accumulates orphaned data in the encrypted_value table] (<a href="https://github.com/cloudfoundry/credhub/issues/231">https://github.com/cloudfoundry/credhub/issues/231</a>) ## Security Fixes * Various dependency bumps **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.69...2.12.70">https://github.com/pivotal/credhub-release/compare/2.12.69...2.12.70</a></pre> </div>                                                                                                                         |
|           |         | <p>▼ 2.12.69</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Security fixes * Bumped netty-codec-http to fix CVE-2024-29025. ## What's Changed * Documented how to clean up orphaned encrypted_value records. * Removed a fix that was released in 2.12.67 for a bug that caused CredHub to leave orphaned encrypted_value records - it required permissions for adding triggers to the database that are not available in some databases. * Various dependency bumps. **Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.66...2.12.69">https://github.com/pivotal/credhub-release/compare/2.12.66...2.12.69</a></pre> </div> |
|           |         | <p>▼ 2.12.67</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed ### Known Issues * This CredHub release might fail to start if CredHub is configured with a database vendor that enforces additional access control on database triggers creation (e.g. Amazon RDS), as this release will attempt to create database triggers at start time. This issue is still under investigation. We recommend that you</pre> </div>                                                                                                                                                                                                                            |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>do not use this release if you are using vendors like Amazon RDS.</p> <ul style="list-style-type: none"> <li>### Fixes <ul style="list-style-type: none"> <li>* Fixed issue #231 [CredHub accumulates orphaned data in the encrypted_value table] (<a href="#">cloudfoundry/credhub/issues/231</a>)</li> </ul> </li> <li>### Dependency Bumps <ul style="list-style-type: none"> <li>* Build(deps): bump com.google.guava:guava from 33.0.0-jre to 33.1.0-jre</li> <li>* Build(deps): bump org.postgresql:postgresql from 42.7.2 to 42.7.3</li> <li>* Build(deps): bump com.google.api.grpc:proto-google-common-protos</li> <li>* Build(deps): bump org.owasp:dependency-check-gradle from 9.0.9 to 9.0.10</li> </ul> </li> </ul> <p>**Full Changelog**: <a href="https://github.com/pivotal/credhub-release/compare/2.12.66...2.12.67">https://github.com/pivotal/credhub-release/compare/2.12.66...2.12.67</a></p> |
| diego     | 2.98.0  | <p>▼ v2.98.0</p> <pre> ## Changes - Update Golang to 1.22 ## Bosh Job Spec changes: ```diff diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index 7eb920159..d61278357 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ ``` name: vizzini packages: - - golang-1.21-linux + - golang-1.22-linux - vizzini templates: ```  ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.97.0...v2.98.0">https://github.com/cloudfoundry/diego-release/compare/v2.97.0...v2.98.0</a> ## Resources - [Download release 2.98.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.98.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.98.0</a>).</pre>                                                                                                                    |

| Component                     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dotnet-core-offline-buildpack | 2.4.27  | <p>▼ 2.4.27</p> <pre> * Update default .NET Core version in build   pack from 6.0.0.x to 8.0.0.x * Add dotnet-runtime 6.0.0.29, remove dotnet-   runtime 6.0.0.28 for stack(s) cflinuxfs4, cflin   ufs3 * Add dotnet-runtime 7.0.0.18, remove dotnet-   runtime 7.0.0.17 for stack(s) cflinuxfs4, cflin   ufs3 * Add dotnet-runtime 8.0.0.4, remove dotnet-r   untime 8.0.0.3 for stack(s) cflinuxfs4, cflinux   fs3 * Add dotnet-sdk 6.0.0.421, remove dotnet-sdk   6.0.0.420 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 7.0.0.408, remove dotnet-sdk   7.0.0.407 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-sdk 8.0.0.204, remove dotnet-sdk   8.0.0.203 for stack(s) cflinuxfs4, cflinuxfs3 * Add dotnet-aspnetcore 6.0.0.29, remove dotn   et-aspnetcore 6.0.0.28 for stack(s) cflinuxfs4,   cflinuxfs3 * Add dotnet-aspnetcore 7.0.0.18, remove dotn   et-aspnetcore 7.0.0.17 for stack(s) cflinuxfs4,   cflinuxfs3 * Add dotnet-aspnetcore 8.0.0.4, remove dotne   t-aspnetcore 8.0.0.3 for stack(s) cflinuxfs4, c   flinuxfs3 * Add node 20.12.2, remove node 20.11.1 for   stack(s) cflinuxfs3, cflinuxfs4   name   version   cf_stacks    - - -    bower   1.8.14   cflinuxfs3, cflinuxfs4     dotnet-aspnetcore   6.0.0.29   cflinuxfs3,   cflinuxfs4     dotnet-aspnetcore   7.0.0.18   cflinuxfs3,   cflinuxfs4     dotnet-aspnetcore   8.0.0.4   cflinuxfs3, c   flinuxfs4     dotnet-runtime   6.0.0.29   cflinuxfs3, cfl   inuxfs4     dotnet-runtime   7.0.0.18   cflinuxfs3, cfl   inuxfs4     dotnet-runtime   8.0.0.4   cflinuxfs3, cflin   ufs4     dotnet-sdk   6.0.0.421   cflinuxfs3, cflinu   xfs4     dotnet-sdk   7.0.0.408   cflinuxfs3, cflinu   xfs4     dotnet-sdk   8.0.0.204   cflinuxfs3, cflinu   xfs4     libgdiplus   6.1   cflinuxfs3     libgdiplus   6.1   cflinuxfs4     libunwind   1.8.1   cflinuxfs3     libunwind   1.8.1   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4   </pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |         | <pre>Default binary versions:   name   version     -   -     dotnet-runtime   8.0.x     dotnet-aspnetcore   8.0.x     dotnet-sdk   8.0.x     bower   1.8.x   * Uncached buildpack SHA256: 1d70ed87640004 83b61bd54e8b63b4ced2cace1e5ba65a1516425b1f848 cf755 * Uncached buildpack SHA256: 6093eff801445a c688841553e40f9c760be0385d3008b12f99b8d96bc83 d16b5</pre>                                                                                                                                                               |
| garden-runc | 1.52.0  | <p>▼ v1.52.0</p> <pre>## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.51.0...v1.52.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.51.0...v1.52.0</a> ## Resources - [Download release 1.52.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.52.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.52.0</a>).</pre> |

| Component                       | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| go-offline-buildpack            | 1.10.18  | <p>▼ 1.10.18</p> <pre>* Add go 1.21.9, remove go 1.21.8 for stack (s) cflinuxfs3, cflinuxfs4 (#441) * Add go 1.22.2, remove go 1.22.1 for stack (s) cflinuxfs3, cflinuxfs4 (#442)   name   version   cf_stacks    - - -   dep   0.5.4   cflinuxfs3     dep   0.5.4   cflinuxfs4     glide   0.13.3   cflinuxfs3     glide   0.13.3   cflinuxfs4     go   1.21.9   cflinuxfs3     go   1.21.9   cflinuxfs4     go   1.22.2   cflinuxfs3     go   1.22.2   cflinuxfs4     godep   80   cflinuxfs3     godep   80   cflinuxfs4   Default binary versions:   name   version    - -   go   1.21.x   * Uncached buildpack SHA256: 5c558a7007327b 161c22a35364c3c6efb8462b0fbed1bb971d1383517fb f8a8d * Uncached buildpack SHA256: e49a42b9d164e0 b3e393d22cd3e9f6c4711be46389d93acc5709de40970 fa9a1</pre> |
| java-offline-buildpack          | 4.68.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| java-native-image-cnb-buildpack | 0.10.3   | <p>▼ 0.10.3</p> <pre>Components: * [buildpack v0.12.4] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.4">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.4</a>)</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| log-cache                       | 3.0.12   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| loggregator                     | 107.0.14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.1.0   | <p>▼ v8.1.0</p> <pre>## What's Changed * Replace usages of `grpc.Dial` with `grpc.NewClient` which does not open connections until necessary * Bump dependencies ### Experimental OTel Collector changes * Added `temporary_emit_otel_traces` property to the loggr-forwarder-agent and loggr-forwarder-agent-windows jobs. Setting this property to `true` activates conversion of appropriately tagged http timers to OpenTelemetry traces (it defaults to `false`). See cloudfoundry/gorouter#407. **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.3...v8.1.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.3...v8.1.0</a></pre> <p>▼ v8.0.4</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>Don't use. It contains the code changes from v8.1.0 but without a semver minor bump to indicate new functionality.</p> </div> |
| mapfs             | 1.2.68  | <p>▼ v1.2.68</p> <pre>## Dependencies * **gomega:** Updated to v1.33.0. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>). * **mapfs:** Updated to v`3fb73af`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> <p>▼ v1.2.67</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Dependencies * **mapfs:** Updated to v`b5baec0`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> </div>                                                                                                                                                                                                                                                                           |
| metric-registrar  | 3.0.3   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| mysql-monitoring  | 10.13.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats       | 56.19.0 | <p>▼ v56.19.0</p> <pre> ## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.18.0...v56.19.0">https://github.com/cloudfoundry/nats-release/compare/v56.18.0...v56.19.0</a> ## Resources - [Download release 56.19.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.19.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.19.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| nfs-volume | 7.1.63  | <p>▼ v7.1.63</p> <pre> ## Changes * Add final release 7.1.62 [ci skip] ## Dependencies * **gomega:** Updated to v1.33.0. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>). * **nfsbroker:** Updated to v`5d71277`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>). * **nfsv3driver:** Updated to v`31062e6`. For more information, see [nfsv3driver] (<a href="https://github.com/cloudfoundry/nfsv3driver">https://github.com/cloudfoundry/nfsv3driver</a>). </pre> <p>▼ v7.1.62</p> <pre> ## Changes * Bump sqlite from 3.45.2 to 3.45.3 (#881) ## Dependencies * **nfsbroker:** Updated to v`680bc33`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>). * **nfsv3driver:** Updated to v`279655c`. For more information, see [nfsv3driver] (<a href="https://github.com/cloudfoundry/nfsv3driver">https://github.com/cloudfoundry/nfsv3driver</a>). </pre> |

| Component               | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack | 1.2.13  | <p>▼ 1.2.13</p> <pre>* Updating github-config (#274)   name   version   cf_stacks    - - -   nginx   1.24.0   cflinuxfs3     nginx   1.24.0   cflinuxfs4     nginx   1.25.4   cflinuxfs3     nginx   1.25.4   cflinuxfs4     openresty   1.21.4.2   cflinuxfs3     openresty   1.21.4.2   cflinuxfs4     openresty   1.25.3.1   cflinuxfs3     openresty   1.25.3.1   cflinuxfs4   Default binary versions:   name   version    - -    nginx   1.25.x   * Uncached buildpack SHA256: a8bcd08605ef71 db790fc0f25481ea34cd4cf705cb9d1cbd737537b5fcc 16ac8 * Uncached buildpack SHA256: 6adb381aeaf1fc7 f1066e25eb4348317c39b7aef6d5c899ba78e4e1b7b21 39858</pre> |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nodejs-offline-buildpack | 1.8.24  | <p>▼ 1.8.24</p> <pre> * Add node 18.20.2, remove node 18.19.0 (#717)   for stack(s) cflinuxfs3, cflinuxfs4   (<a href="https://www.pivotaltracker.com/story/show/187406609">https://www.pivotaltracker.com/story/show/187406609</a>) * Add node 20.12.2, remove node 20.11.0 (#716)   for stack(s) cflinuxfs4, cflinuxfs3   (<a href="https://www.pivotaltracker.com/story/show/187406689">https://www.pivotaltracker.com/story/show/187406689</a>) * Add python 3.11.9, remove python 3.11.8 (#712)   for stack(s) cflinuxfs4, cflinuxfs3   (<a href="https://www.pivotaltracker.com/story/show/187354849">https://www.pivotaltracker.com/story/show/187354849</a>) * Updating github-config (#706)   name   version   cf_stacks    - - -    node   18.19.1   cflinuxfs3     node   18.19.1   cflinuxfs4     node   18.20.2   cflinuxfs3     node   18.20.2   cflinuxfs4     node   20.11.1   cflinuxfs3     node   20.11.1   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     yarn   1.22.19   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    node   18.x     python   3.11.x   * Uncached buildpack SHA256: 140b82e74a883754ff987b47e41eb1103bb4616b2c4aa0ba23c42cb00fe1b670 * Uncached buildpack SHA256: b23bf383be6d3332484b6a7033bfca8b36a50a7cadf6d87ee608a104e3e55d9f </pre> |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| notifications    | 70.0.0  | <p>▼ v70.0.0</p> <div style="border: 1px solid black; padding: 5px;"><ul style="list-style-type: none"><li>* add spec options to specify max number of retries and max queue length for jobs</li><li>* default length to 5000 and reduce number of retries from 9 to 5</li><li>* fix deploy errand to report when cf push fails correctly</li><li>* fix deploy errand to not fail upgrades due to intermixing new and old code.</li></ul></div> |
| notifications-ui | 47.0.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| otel-collector   | 0.4.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| php-offline-buildpack | 4.6.18  | <p>▼ 4.6.18</p> <pre> * Add php 8.2.18, remove php 8.2.16 for stack(s) cflinuxfs4, cflinuxfs3 * Add php 8.3.6, remove php 8.3.3 for stack(s) cflinuxfs4, cflinuxfs3 * Add httpd 2.4.59, remove httpd 2.4.58 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks   modules    --- --- ---    appdynamics   23.11.0-839   cflinuxfs3, cflinuxfs4       composer   2.7.2   cflinuxfs3, cflinuxfs4             httpd   2.4.59   cflinuxfs3       httpd   2.4.59   cflinuxfs4       newrelic   10.11.0.3   cflinuxfs3, cflinuxfs4       nginx   1.24.0   cflinuxfs3       nginx   1.24.0   cflinuxfs4       nginx   1.25.4   cflinuxfs3       nginx   1.25.4   cflinuxfs4       php   8.1.26   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lz4, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.26   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lz4, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.27   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, iconv, ldap, lz4, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib   </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> mp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.1.27   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaf, yaml, zip, zlib     php   8.2.17   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.2.17   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.2.18   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh 2, stomp, sysvmsg, sysvsem, sysvshm, tideways _xhprof, tidy, xdebug, xsl, yaml, zip, zlib     php   8.2.18   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ioncube, ldap, lzf, mailparse, maxminddb, mbstring </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <p>ing, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.4   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzfs, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.4   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzfs, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.6   cflinuxfs3   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzfs, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  php   8.3.6   cflinuxfs4   amqp, apcu, bz2, curl, dba, enchant, exif, fileinfo, ftp, gd, gettext, gmp, igbinary, imagick, imap, ldap, lzfs, mailparse, maxminddb, mbstring, memcached, mongodb, msgpack, mysqli, oauth, opcache, openssl, pcntl, pdo, pdo_firebird, pdo_mysql, pdo_odbc, pdo_pgsql, pdo_sqlite, pdo_sqlsrv, pgsql, phalcon, phpiredis, pspell, psr, rdkafka, readline, redis, shmop, snmp, soap, sockets, sodium, solr, sqlsrv, ssh2, stomp, sysvmsg, sysvsem, sysvshm, tideways_xhprof, tidy, xdebug, xsl, yaml, zip, zlib  </p> <p>  python   2.7.18   cflinuxfs4    </p> |  |

| Component                  | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |          | <pre>   ruby   3.0.5   cflinuxfs4     Default binary versions:   name   version    - -    php   8.1.27     httpd   2.4.59     newrelic   10.11.0.3     nginx   1.25.4     composer   2.7.2   * Uncached buildpack SHA256: 0a3064a52cf955 fd63a97f721b71c884f7ff4b1f6feebf28ee6ed24cd81 38444 * Uncached buildpack SHA256: a8ec252ebb290f f8bca22136821a9ba695831688b14120f3a0e9135f264 ebf3d </pre>                                                                                                                                                                          |
| push-apps-manager-release  | 677.0.42 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| push-offline-docs-release  | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| push-usage-service-release | 674.0.98 | <p>▼ v674.0.98</p> <pre> ## Changes * creating final release 674.0.97 ## Dependencies * **app-usage-service:** Updated to v`159f3 78`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>). </pre> <p>▼ v674.0.97</p> <pre> ## Dependencies * **app-usage-service:** Updated to v`7d0ce 49`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>). </pre> |
| pxc                        | 1.0.27   | <p>▼ v1.0.27</p> <pre> ## Release Notes - Adds new job for percona-xtrabackup-2.4 - Adds new job for percona-xtrabackup-8.0 **Dependency bumps** - None **Bugs fixed** - mysql_slow_query.log no longer leaks sensitive secrets </pre>                                                                                                                                                                                                                                                                                                                                       |

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| python-offline-buildpack | 1.8.23  | <p>▼ 1.8.23</p> <pre> * Add setuptools 69.5.1, remove setuptools 69.2.0   for stack(s) cflinuxfs4, cflinuxfs3     (<a href="https://www.pivotaltracker.com/story/show/187426113">https://www.pivotaltracker.com/story/show/187426113</a>) * Add python 3.12.3, remove python 3.12.2 (#904)   for stack(s) cflinuxfs3, cflinuxfs4     (<a href="https://www.pivotaltracker.com/story/show/187398328">https://www.pivotaltracker.com/story/show/187398328</a>) * Add python 3.11.9, remove python 3.11.8 (#903)   for stack(s) cflinuxfs4, cflinuxfs3     (<a href="https://www.pivotaltracker.com/story/show/187354849">https://www.pivotaltracker.com/story/show/187354849</a>) * Add python 3.10.14, remove python 3.10.13 (#901)   for stack(s) cflinuxfs4, cflinuxfs3     (<a href="https://www.pivotaltracker.com/story/show/187273725">https://www.pivotaltracker.com/story/show/187273725</a>) * Add python 3.9.19, remove python 3.9.18 (#900)   for stack(s) cflinuxfs3, cflinuxfs4     (<a href="https://www.pivotaltracker.com/story/show/187271197">https://www.pivotaltracker.com/story/show/187271197</a>) * Add python 3.8.19, remove python 3.8.18 (#899)   for stack(s) cflinuxfs3, cflinuxfs4     (<a href="https://www.pivotaltracker.com/story/show/187270980">https://www.pivotaltracker.com/story/show/187270980</a>)   name   version   cf_stacks    - - -    libffi   3.2.1   cflinuxfs3, cflinuxfs4     libmemcache   1.0.18   cflinuxfs3, cflinuxfs4     miniconda3-py39   24.1.2   cflinuxfs3, cflinuxfs4     pip   24.0   cflinuxfs3, cflinuxfs4     pipenv   2023.12.1   cflinuxfs3     pipenv   2023.12.1   cflinuxfs4     python   3.8.19   cflinuxfs3     python   3.8.19   cflinuxfs4     python   3.9.19   cflinuxfs3     python   3.9.19   cflinuxfs4     python   3.10.14   cflinuxfs3     python   3.10.14   cflinuxfs4     python   3.11.9   cflinuxfs3     python   3.11.9   cflinuxfs4     python   3.12.3   cflinuxfs3     python   3.12.3   cflinuxfs4     setuptools   69.5.1   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -  </pre> |

| Component           | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |         | <pre>  python   3.10.x   * Uncached buildpack SHA256: 0d4fb765c07620 a46968ac6e556762e8c7afe2bd0cc8b4f1da5acaae300 4a496 * Uncached buildpack SHA256: dfa231d89974e2 79f84e51db50a353042c5853e78d31946185fdac20c6b adb70</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| r-offline-buildpack | 1.2.11  | <p>▼ 1.2.11</p> <pre>* Add r 4.3.3, remove r 4.3.2 for stack(s) cflinuxfs3, cflinuxfs4 * Update r 4.2.3 dependencies for stack(s) cflinuxfs3, cflinuxfs4: * plumber from 1.2.1 to 1.2.2 * shiny from 1.8.0 to 1.8.1.1   name   version   cf_stacks   modules    - - -    r   3.6.3   cflinuxfs3   forecast, plumber, rserve, shiny     r   4.2.3   cflinuxfs3   forecast, plumber, rserve, shiny     r   4.2.3   cflinuxfs4   forecast, plumber, rserve, shiny     r   4.3.3   cflinuxfs3   forecast, plumber, rserve, shiny     r   4.3.3   cflinuxfs4   forecast, plumber, rserve, shiny   * Uncached buildpack SHA256: a72c532106fca2 4a9e8cb4fbef5e4be438985b5b84c0a6fef522ef53f06 f5849 * Uncached buildpack SHA256: 27bd5acf1658c8 308787581f5c2ec5e1e569e1adb7c4ddb5f251ae7820f 51b1a</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.296.0 | <p>▼ v0.296.0</p> <pre> ## Changes - Pass availability zone in route-registrar for AZ-aware routing of system components - Bump Golang to 1.22 ## Bosh Job Spec changes: ```diff diff --git a/jobs/acceptance_tests/spec b/jobs/acceptance_tests/spec index e1a6a9ae..8122ddaf 100644 --- a/jobs/acceptance_tests/spec +++ b/jobs/acceptance_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.21-linux + - golang-1.22-linux - acceptance_tests - rtr - cf-cli-8-linux diff --git a/jobs/smoke_tests/spec b/jobs/smoke_tests/spec index b230192b..02edfd9d 100644 --- a/jobs/smoke_tests/spec +++ b/jobs/smoke_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.21-linux + - golang-1.22-linux - acceptance_tests - cf-cli-8-linux ``` ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.295.0...v0.296.0">https://github.com/cloudfoundry/routing-release/compare/v0.295.0...v0.296.0</a> ## Resources - [Download release 0.296.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.296.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.296.0</a>).</pre> |

| Component              | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ruby-offline-buildpack | 1.10.13 | <p>▼ 1.10.13</p> <pre> * Enable rails 7.1 compatibility for buildpack (#925) * Add rubygems 3.5.9, remove rubygems 3.5.8 (#932)   for stack(s) cflinuxfs4, cflinuxfs3 [#187420578] * Add rubygems 3.5.8, remove rubygems 3.5.7 (#930)   for stack(s) cflinuxfs4, cflinuxfs3 * Add bundler 2.5.9, remove bundler 2.5.8 (#931)   for stack(s) cflinuxfs4, cflinuxfs3 * Add bundler 2.5.8, remove bundler 2.5.7 (#929)   for stack(s) cflinuxfs4, cflinuxfs3 * Add node 20.12.2, remove node 20.12.1 (#926)   for stack(s) cflinuxfs3, cflinuxfs4 * Deprecate Ruby 3.0.X (EOL) * Add rubygems 3.5.7, remove rubygems 3.5.6 for stack(s) cflinuxfs4, cflinuxfs3 * Add bundler 2.5.7, remove bundler 2.5.6 for stack(s) cflinuxfs4, cflinuxfs3 * Add node 20.12.1, remove node 20.11.1 for stack(s) cflinuxfs4, cflinuxfs3   name   version   cf_stacks    - - -   bundler   2.5.9   cflinuxfs3, cflinuxfs4       jruby   9.4.6.0   cflinuxfs3     jruby   9.4.6.0   cflinuxfs4     node   20.12.2   cflinuxfs3     node   20.12.2   cflinuxfs4     openjdk1.8-latest   1.8.0   cflinuxfs3, cflinuxfs4     ruby   3.1.3   cflinuxfs3     ruby   3.1.3   cflinuxfs4     ruby   3.1.4   cflinuxfs3     ruby   3.1.4   cflinuxfs4     ruby   3.2.2   cflinuxfs3     ruby   3.2.2   cflinuxfs4     ruby   3.2.3   cflinuxfs3     ruby   3.2.3   cflinuxfs4     ruby   3.3.0   cflinuxfs3     ruby   3.3.0   cflinuxfs4     rubygems   3.5.9   cflinuxfs3, cflinuxfs4       yarn   1.22.22   cflinuxfs3, cflinuxfs4   Default binary versions:   name   version    - -    ruby   3.2.x   * Uncached buildpack SHA256: e40ebcd8e47d99a7b6c56dd784074d5a9de4c01a75e6d0cd13bb95252c46649 </pre> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |         | <ul style="list-style-type: none"> <li>* Uncached buildpack SHA256: 80e4fe57a72551e42e6077bab42f12e6351799bd4d4d640d2fd3fccf3cbff190</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| web-servers-cnb-buildpack | 0.13.0  | <p>▼ 0.13.0</p> <div style="border: 1px solid #ccc; padding: 10px; margin-bottom: 10px;"> <b>Components:</b> <ul style="list-style-type: none"> <li>* [buildpack v0.16.0] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.0">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.16.0</a>)</li> </ul> </div> <p>▼ 0.12.0</p> <div style="border: 1px solid #ccc; padding: 10px; margin-bottom: 10px;"> <b>Components:</b> <ul style="list-style-type: none"> <li>* [buildpack v0.15.0] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.15.0">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.15.0</a>)</li> </ul> </div> |
| silk                      | 3.46.0  | <p>▼ v3.46.0</p> <div style="border: 1px solid #ccc; padding: 10px; margin-bottom: 10px;"> <pre>## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.45.0...v3.46.0">https://github.com/cloudfoundry/silk-release/compare/v3.45.0...v3.46.0</a> ## Resources - [Download release 3.46.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.46.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.46.0</a>).</pre> </div>                                                                                                                                                      |
| smb-volume                | 3.1.66  | <p>▼ v3.1.66</p> <div style="border: 1px solid #ccc; padding: 10px; margin-bottom: 10px;"> <pre>## Changes * Add final release 3.1.65 [ci skip] ## Dependencies * **smbbroker:** Updated to v`b2fb57d`. For more information, see [smbbroker] (<a href="https://github.com/cloudfoundry/smbbroker">https://github.com/cloudfoundry/smbbroker</a>). * **smbdriver:** Updated to v`2335f8e`. For more information, see [smbdriver] (<a href="https://github.com/cloudfoundry/smbdriver">https://github.com/cloudfoundry/smbdriver</a>).</pre> </div>                                                                                                                                                                                          |
| smoke-tests               | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.12  | <p>▼ 1.6.12</p> <pre>* Updating github-config (#415)   name   version   cf_stacks    - - -   nginx   1.24.0   cflinuxfs3     nginx   1.24.0   cflinuxfs4     nginx   1.25.4   cflinuxfs3     nginx   1.25.4   cflinuxfs4   Default binary versions:   name   version    - -   nginx   1.25.x   * Uncached buildpack SHA256: 658d54e795ab94 3127061d29cec3d442801d88dac0aba8c4c1ddd93a5ba 1eb87 * Uncached buildpack SHA256: d7dfffa3868a7d2 ae43e7de366d753f572cf275416045234cdf4fc25ee36 07938</pre> |
| statsd-injector              | 1.11.40 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| syslog                       | 12.2.5  | <p>▼ v12.2.5</p> <pre>## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.2.4...v12.2.5">https://github.com/cloudfoundry/syslog-release/compare/v12.2.4...v12.2.5</a></pre>                                                                                                                                                                                                                                                 |
| system-metrics-scraper       | 4.0.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa               | 77.7.0  | <p>▼ v77.7.0</p> <pre> ## What's Changed Fix performance issue recently introduced by reverting the [PR] (<a href="https://github.com/cloudfoundry/uaa/pull/2704">https://github.com/cloudfoundry/uaa/pull/2704</a>) that caused it.  ### New UAA * Bump to [UAA v77.7.0] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.7.0">https://github.com/cloudfoundry/uaa/releases/tag/v77.7.0</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.7.0...v77.7.0">https://github.com/cloudfoundry/uaa-release/compare/v77.7.0...v77.7.0</a> </pre> <p>▼ v77.6.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.6.0] (<a href="https://github.com/cloudfoundry/uaa/releases/tag/v77.6.0">https://github.com/cloudfoundry/uaa/releases/tag/v77.6.0</a>) ### Misc * [Upgrade Bellsoft JDK to version 17.0.11+10] (<a href="https://github.com/cloudfoundry/uaa-release/commit/6d6fb64e02976d1d047a7a07e7eb1269eca2804d">https://github.com/cloudfoundry/uaa-release/commit/6d6fb64e02976d1d047a7a07e7eb1269eca2804d</a>) * [Upgrade Tomcat to version 9.0.88] (<a href="https://github.com/cloudfoundry/uaa-release/commit/7803ae2ef864f9bb9650741cae0439be52f965dd">https://github.com/cloudfoundry/uaa-release/commit/7803ae2ef864f9bb9650741cae0439be52f965dd</a>) * Solve issue #850 by @strehle in <a href="https://github.com/cloudfoundry/uaa-release/pull/851">https://github.com/cloudfoundry/uaa-release/pull/851</a> ### Dependency Bumps * Bump <a href="https://github.com/cloudfoundry/bosh-utils">github.com/cloudfoundry/bosh-utils</a> from 0.0.456 to 0.0.457 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/848">https://github.com/cloudfoundry/uaa-release/pull/848</a> * Bump <a href="https://github.com/mini-portile2">mini_portile2</a> from 2.8.5 to 2.8.6 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/847">https://github.com/cloudfoundry/uaa-release/pull/847</a> * Bump <a href="https://github.com/onsi/gomega">method_source</a> from 1.0.0 to 1.1.0 by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/849">https://github.com/cloudfoundry/uaa-release/pull/849</a> * Bump <a href="https://github.com/onsi/gomega">github.com/onsi/gomega</a> from 1.32.0 to 1.33.0 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/852">https://github.com/cloudfoundry/uaa-release/pull/852</a> * Bump <a href="https://github.com/cloudfoundry/bosh-utils">github.com/cloudfoundry/bosh-utils</a> from 0.0.457 to 0.0.458 in /src/acceptance_tests by @dependabot in <a href="https://github.com/cloudfoundry/uaa-release/pull/853">https://github.com/cloudfoundry/uaa-release/pull/853</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/uaa-release/compare/v77.5.0...v77.6.0">https://github.com/cloudfoundry/uaa-release/compare/v77.5.0...v77.6.0</a> </pre> |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## 6.0.1

**Release Date:** 04/17/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue](#).

- **[Known Issue]** A UAA performance regression causes slow user queries with MySQL when there is a large number of users (fixed in TAS 6.0.2).
- **[Feature]** Add option to enable concurrent read/writes for HTTP/1
- **[Feature Improvement]** Remove requirement for manually enabling log cache syslog ingestion when upgrading
- **[Bug Fix]** Fix pre-start hang in internal MySQL
- Bump backup-and-restore-sdk to version [1.19.10](#)
- Bump bpm to version [1.2.18](#)
- Bump capi to version [1.177.0](#)
- Bump diego to version [2.97.0](#)
- Bump java-native-image-cnb-buildpack to version [0.10.2](#)
- Bump log-cache to version [3.0.12](#)
- Bump loggregator to version [107.0.14](#)
- Bump loggregator-agent to version [8.0.3](#)
- Bump mapfs to version [1.2.66](#)
- Bump metric-registrar to version [3.0.3](#)
- Bump mysql-monitoring to version [10.13.0](#)
- Bump nats to version [56.18.0](#)
- Bump nfs-volume to version [7.1.61](#)
- Bump otel-collector to version [0.4.1](#)
- Bump push-apps-manager-release to version [677.0.42](#)
- Bump push-usage-service-release to version [674.0.96](#)
- Bump pxc to version [1.0.26](#)
- Bump web-servers-cnb-buildpack to version [0.11.1](#)
- Bump smb-volume to version [3.1.64](#)
- Bump smoke-tests to version [4.10.0](#)
- Bump statsd-injector to version [1.11.40](#)

- Bump syslog to version 12.2.4
- Bump system-metrics-scraper to version 4.0.8
- Bump uaa to version 77.5.0

| Component                | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ubuntu-jammy stemcell    | 1.423   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| backup-and-restore-sdk   | 1.19.10 | <p>▼ v1.19.10</p> <pre>## Changes * Golang: Updated to v1.22.2. (#1621) ## Dependencies * **net:** Updated to v0.24.0. For more information, see [net] (https://github.com/golang/net). * **oauth2:** Updated to v0.19.0. For more information, see [oauth2] (https://github.com/golang/oauth2).</pre> <p>▼ v1.19.9</p> <pre>## Dependencies * **storage:** Updated to v1.40.0. For more information, see [storage] (https://github.com/googleapis/google-cloud-go). * **bosh-backup-and-restore:** Updated to v1.9.62. For more information, see [bosh-backup-and-restore] (https://github.com/cloudfoundry-incubator/bosh-backup-and-restore). * **mysql:** Updated to v1.8.1. For more information, see [mysql] (https://github.com/go-sql-driver/mysql). * **v2:** Updated to v2.17.1. For more information, see [v2] (https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.32.0. For more information, see [gomega] (https://github.com/onsi/gomega). * **api:** Updated to v0.172.0. For more information, see [api] (https://github.com/googleapis/google-api-go-client).</pre> |
| binary-offline-buildpack | 1.1.10  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| bpm                      | 1.2.18  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| capi                     | 1.177.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| cf-autoscaling           | 250.2.2 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| cf-cli                   | 1.60.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking                   | 3.45.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| cflinuxfs3                      | 0.387.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| cflinuxfs4                      | 1.82.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| count-cores-indicator           | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| credhub                         | 2.12.66 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| diego                           | 2.97.0  | <p>▼ v2.97.0</p> <pre>## Changes - Adds support for comma-delimited destinations in ASGs   - See: <a href="https://github.com/cloudfoundry/executor/pull/96">https://github.com/cloudfoundry/executor/pull/96</a> and <a href="https://github.com/cloudfoundry/bbs/pull/94">https://github.com/cloudfoundry/bbs/pull/94</a> - Bump bosh package blobs - Bumps `jq` to `1.7.1` - Bumps `tar` - Bump go.mod dependencies ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.96.0...v2.97.0">https://github.com/cloudfoundry/diego-release/compare/v2.96.0...v2.97.0</a> ## Resources - [Download release 2.97.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.97.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.97.0</a>).</pre> |
| dotnet-core-offline-buildpack   | 2.4.26  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| garden-runc                     | 1.51.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| go-offline-buildpack            | 1.10.17 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| java-offline-buildpack          | 4.67.1  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| java-native-image-cnb-buildpack | 0.10.2  | <p>▼ 0.10.2</p> <pre>Components: * [buildpack v0.12.2] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.2">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.2</a>)</pre> <p>▼ 0.10.1</p> <pre>Components: * [buildpack v0.12.1] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.1">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.1</a>)</pre>                                                                                                                                                                                                                                                                                                                                                                    |

| Component         | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache         | 3.0.12   | <p>▼ v3.0.12</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/log-cache-release/compare/v3.0.11...v3.0.12">https://github.com/cloudfoundry/log-cache-release/compare/v3.0.11...v3.0.12</a></pre>                                                                                                                                                                   |
| loggregator       | 107.0.14 | <p>▼ v107.0.14</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-release/compare/v107.0.13...v107.0.14">https://github.com/cloudfoundry/loggregator-release/compare/v107.0.13...v107.0.14</a></pre> |
| loggregator-agent | 8.0.3    | <p>▼ v8.0.3</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.2...v8.0.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.2...v8.0.3</a></pre>    |

| Component        | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mapfs            | 1.2.66  | <p>▼ v1.2.66</p> <pre>## Dependencies * **mapfs:** Updated to v`b0b6bfa`. For more information, see [mapfs](https://github.com/cloudfoundry/mapfs).</pre> <p>▼ v1.2.65</p> <pre>## Changes * Golang: Updated to v1.22.2. (#241) ## Dependencies * **mapfs:** Updated to v`a80b833`. For more information, see [mapfs](https://github.com/cloudfoundry/mapfs).</pre> <p>▼ v1.2.64</p> <pre>## Dependencies * **v2:** Updated to v2.17.1. For more information, see [v2](https://github.com/onsi/ginkgo). * **mapfs:** Updated to v`cd8e7e6`. For more information, see [mapfs](https://github.com/cloudfoundry/mapfs).</pre> |
| metric-registrar | 3.0.3   | <p>▼ v3.0.3</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9](https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ) **Full Changelog**: <a href="https://github.com/pivotal-cf/metric-registrar-release/compare/v3.0.2...v3.0.3">https://github.com/pivotal-cf/metric-registrar-release/compare/v3.0.2...v3.0.3</a></pre>                                                                                                                                                                                                                                                             |
| mysql-monitoring | 10.13.0 | <p>▼ v10.13.0</p> <pre>- Updates golang to 1.22.2 - Updates dependencies</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nats      | 56.18.0 | <p>▼ v56.18.0</p> <pre>## Changes - Bump golang package dependencies ## Built with go 1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.17.0...v56.18.0">https://github.com/cloudfoundry/nats-release/compare/v56.17.0...v56.18.0</a> ## Resources - [Download release 56.18.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.18.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.18.0</a>).</pre> <p>▼ v56.17.0</p> <pre>## Changes - Bump dependencies ## Built with go 1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.16.0...v56.17.0">https://github.com/cloudfoundry/nats-release/compare/v56.16.0...v56.17.0</a> ## Resources - [Download release 56.17.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.17.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.17.0</a>).</pre> <p>▼ v56.16.0</p> <pre>## Changes * Add staticcheck config by @geofffranks in <a href="https://github.com/cloudfoundry/nats-release/pull/75">https://github.com/cloudfoundry/nats-release/pull/75</a> * Bump dependancies ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/nats-release/compare/v56.15.0...v56.16.0">https://github.com/cloudfoundry/nats-release/compare/v56.15.0...v56.16.0</a> ## Resources - [Download release 56.16.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.16.0">https://bosh.io/releases/github.com/cloudfoundry/nats-release?version=56.16.0</a>).</pre> |

| Component                 | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume                | 7.1.61   | <p>▼ v7.1.61</p> <pre>## Changes * Golang: Updated to v1.22.2 (#860) * Bump openssl- from 3.2.1 to 3.3.0 (#871) ## Dependencies * **nfsbroker:** Updated to v`1a70719`. For more information, see [nfsbroker](https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`35b8c6f`. For more information, see [nfsv3driver](https://github.com/cloudfoundry/nfsv3driver).</pre> <p>▼ v7.1.60</p> <pre>## Dependencies * **nfsbroker:** Updated to v`8aec99d`. For more information, see [nfsbroker](https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`fb67285`. For more information, see [nfsv3driver](https://github.com/cloudfoundry/nfsv3driver).</pre> |
| nginx-offline-buildpack   | 1.2.12   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| nodejs-offline-buildpack  | 1.8.23   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| notifications             | 69.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| notifications-ui          | 47.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| otel-collector            | 0.4.1    | <p>▼ v0.4.1</p> <pre>## What's Changed * Bump dependencies * Bump to [gol.21.9](https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ) **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.0...v0.4.1</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| php-offline-buildpack     | 4.6.17   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| push-apps-manager-release | 677.0.42 | <p>▼ 677.0.42</p> <pre>* improve performance of the search-server in making capi queries * New autoscaler rule editing workflow</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Component                  | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| push-offline-docs-release  | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| push-usage-service-release | 674.0.96 | <p>▼ v674.0.96</p> <pre>## Dependencies * **app-usage-service:** Updated to v`f2c8a3c`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> <p>▼ v674.0.95</p> <pre>## Dependencies * **app-usage-service:** Updated to v`193129e`. For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> |
| pxc                        | 1.0.26   | <p>▼ v1.0.26</p> <pre>**Dependency bumps** - Updates golang to 1.22.2 - Bumps Percona XtraDB Cluster to v8.0.36-28  **Bugs fixed** - `engine_config.binlog.enabled = false` now correctly disables binary logs for MySQL 8.0</pre>                                                                                                                                                                                                                                                                                        |
| python-offline-buildpack   | 1.8.22   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| r-offline-buildpack        | 1.2.10   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| routing                    | 0.295.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ruby-offline-buildpack     | 1.10.11  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| web-servers-cnb-buildpack  | 0.11.1   | <p>▼ 0.11.1</p> <pre>Components: * [buildpack v0.14.1] (<a href="https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.14.1">https://github.com/pivotal-cf/web-servers-cnb-buildpack/releases/tag/v0.14.1</a>)</pre>                                                                                                                                                                                                                                                                                    |
| silk                       | 3.45.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume  | 3.1.64  | <p>▼ v3.1.64</p> <pre>## Dependencies * **smbbroker:** Updated to v`02f340b`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`fb88dd0`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.63</p> <pre>## Changes * Golang: Updated to v1.22.2 (#381) ## Dependencies * **smbbroker:** Updated to v`b380e77`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`0c36c10`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.62</p> <pre>## Dependencies * **v2:** Updated to v2.17.1. For more information, see [v2](https://github.com/onsi/ginkgo). * **smbbroker:** Updated to v`f176916`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`5ee16dc`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver).</pre> |
| smoke-tests | 4.10.0  | <p>▼ 4.10.0</p> <pre>Create bosh final release 4.10.0</pre> <p>▼ 4.9.5</p> <pre>Create bosh final release 4.9.5 ## What's Changed * Upgrade Golang to 1.22 by @tas-operability-bot in https://github.com/pivotal/smoke-tests/pull/138 **Full Changelog**: https://github.com/pivotal/smoke-tests/compare/4.9.5...4.9.5</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| <b>Component</b>             | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| staticfile-offline-buildpack | 1.6.11         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| statsd-injector              | 1.11.40        | <p>▼ v1.11.40</p> <pre>## What's Changed * Bump dependencies * Bump to [gol.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/statsd-injector-release/compare/v1.1.39...v1.11.40">https://github.com/cloudfoundry/statsd-injector-release/compare/v1.1.39...v1.11.40</a></pre>       |
| syslog                       | 12.2.4         | <p>▼ v12.2.4</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to gol.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.2.3...v12.2.4">https://github.com/cloudfoundry/syslog-release/compare/v12.2.3...v12.2.4</a></pre>                                                                                                                                                                                |
| system-metrics-scraper       | 4.0.8          | <p>▼ v4.0.8</p> <pre>## What's Changed * Bump dependencies * Bump to [gol.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.7...v4.0.8">https://github.com/cloudfoundry/system-metrics-scraper-release/compare/v4.0.7...v4.0.8</a></pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uaa               | 77.5.0  | <p>▼ v77.5.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.5.0] (https://github.com/cloudfoundry/uaa/releases/tag/v77.5.0)   * Spring Framework update from 5.3.33 to 5.3.34 by @dependabot in https://github.com/cloudfoundry/uaa/pull/2822, solves https://spring.io/security/cve-2024-22262 ### Misc * Improve doc on proxy-related spec fields by @peterhaochen47 in https://github.com/cloudfoundry/uaa-release/pull/835 ### Dependency Bumps * Bump github.com/cloudfoundry/bosh-utils from 0.0.453 to 0.0.454 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/836 * Bump rake from 13.1.0 to 13.2.0 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/837 * Bump github.com/cloudfoundry/bosh-utils from 0.0.454 to 0.0.455 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/838 * Bump rake from 13.2.0 to 13.2.1 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/839 * Bump github.com/cloudfoundry/bosh-utils from 0.0.455 to 0.0.456 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/840 * Bump nokogiri from 1.16.3 to 1.16.4 by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/843 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.4.0...v77.5.0 </pre> |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## 6.0.0

**Release Date:** 04/09/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue](#).

- **[Known Issue]** A UAA performance regression causes slow user queries with MySQL when there is a large number of users (fixed in TAS 6.0.2).
- **[Breaking Change]** Remove Developer Portal from TAS
- **[Breaking Change]** Change default internal route service port to 7070
- **[Breaking Change]** No longer install cflinuxfs3 by default
- **[Breaking Change]** Replace cpu entitlement counters with cpu\_entitlement percentage gauge
- **[Breaking Change]** Remove (deprecated) Metrics Agent and Metrics Discovery Release
- **[Breaking Change]:** Move and adapt UAA password complexity policies
- **[Breaking Change]:** Remove ability of UAA to serve as a native SAML identity provider (operators can continue to configure UAA to connect to an external SAML identity provider, using the **Authentication and Enterprise SSO** pane of the TAS for VMs tile configuration)
- **[Breaking Change]** Gorouter's deprecated /varz and /healthz endpoints on port 8080 have been removed
- **[Breaking Change]** Absolute CPU Entitlement metrics no longer available. See [details](#).
- **[Breaking Change]** App Autoscaler introduces incompatibility with load balancers that reject POST requests without a Content-Length header.
- **[Feature]** New form option and migration to opt-into allowing Small Footprint TAS to 'full' TAS upgrade.
- **[Feature]** Add support for NTLM authentication in Gorouter
- **[Feature]** CAPI Enable legacy MD5 buildpack paths
- **[Feature]** Adds Diego support for Docker workloads using OCI images
- **[Feature]:** Gorouters can be configured to prefer routing to app instances in the same AZ as the router
- **[Feature]** Operators can now turn off non-TLS load balancer health check endpoints for Gorouter and TCP Router via the "Enable HTTP load balancer health checks" properties in the "Networking" tab
- **[Feature]** dopplers can be scaled to zero
- **[Feature]** Gorouter now supports LB Health Checks over TLS on port 8443
- **[Feature]** Operators can set the property "Maximum number of network policies per app source" in the "App Developer Controls"
- **[Feature]** CF API now includes routability status from App Readiness checks in the /processes/:id/stats endpoint.
- **[Feature]** Expose a custom environment identifier on component logs forwarded via syslog
- **[Feature]** Advanced Configuration: Do not deploy Diego cells
- **[Feature Improvement]** Make database "encrypt key" setting more intentional, to avoid password-manager autofilling of the field
- **[Feature Improvement]** Reintroduce global log rate limit

- **[Feature Improvement]** OTel Collector marks OTLP Sums as monotonic if they originate from a Loggregator counter
- **[Feature Improvement]** Stop logging out of external OIDC provider when logging out of TAS
- **[Feature Improvement]** Operators can select which protocols Routing API will accept via the “Routing API Endpoint Protocol” property in the Networking tab. This property defaults to the backwards compatible option “both” that works with all tile integrations.
- **[Feature Improvement]** Allow to configure w3c tracing headers in router
- **[Feature Improvement]** [Cloud Controller] Add option to configure Instance File Descriptor Limit
- **[Feature Improvement]** Apps using readiness health checks will now see audit.app.process.notready and audit.app.process.ready events reported to `cf events`
- **[Feature Improvement]** Garden now emits an `UnkillableContainers` metric to help identify cells that will be unable to redeploy successfully without operator intervention
- **[Feature Improvement]** Adds opt-in support for NTLM + other challenge-response based authentication using `Authorization: Negotiate` flows by automatically enabling sticky sessions for those requests.
- **[Feature Improvement]** Adds support for `Partitioned` cookies to allow for sticky sessions in embedded contexts.

| Component                | Version | Release Notes                                                                                                                                                                                                                                     |
|--------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ubuntu-jammy stemcell    | 1.406   |                                                                                                                                                                                                                                                   |
| backup-and-restore-sdk   | 1.19.8  | <p>▼ v1.19.8</p> <pre> ## Dependencies * **v2:** Updated to v2.17.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.32.0. For more information, see [gomega](https://github.com/onsi/gomega). </pre> |
| binary-offline-buildpack | 1.1.10  |                                                                                                                                                                                                                                                   |
| bosh-dns-aliases         | 0.0.4   |                                                                                                                                                                                                                                                   |
| bpm                      | 1.2.17  |                                                                                                                                                                                                                                                   |
| capi                     | 1.175.0 |                                                                                                                                                                                                                                                   |
| cf-autoscaling           | 250.2.2 | <p>▼ v250.2.2</p> <pre> ## What's Changed * Bump dependencies **Full Changelog**: https://github.com/pivotal-cf/cf-autoscaling-release/compare/v250.2.2...v250.2.2 </pre>                                                                         |

| Component | Version | Release Notes |
|-----------|---------|---------------|
| cf-cli    | 1.60.0  |               |

| Component     | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking | 3.45.0  | <p>▼ v3.45.0</p> <pre> ## Changes - Go dependency bumps - Added config for staticcheck - Removed references to consul from documentation ## Bosh Job Spec changes: ```diff diff --git a/jobs/policy-server-asg-syncer/spec b/jobs/policy-server-asg-syncer/spec index 748c39a7..4c6c9a4e 100644 --- a/jobs/policy-server-asg-syncer/spec +++ b/jobs/policy-server-asg-syncer/spec @@ -109,7 +109,7 @@ properties: description: "Trusted CA for UAA server." uaa_hostname: -   description: "Host name for the UAA server. E.g. the service advertised via Consul DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." +   description: "Host name for the UAA server. E.g. the service advertised via Bosh DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." default: uaa.service.cf.internal uaa_port: diff --git a/jobs/policy-server-internal/spec b/jobs/policy-server-internal/spec index 7095775d..029e723f 100644 --- a/jobs/policy-server-internal/spec +++ b/jobs/policy-server-internal/spec @@ -41,7 +41,7 @@ properties: default: 31946 health_check_timeout_seconds: -   description: "Health check timeout for Consul DNS." +   description: "Health check timeout" default: 5 internal_listen_port: @@ -52,7 +52,7 @@ properties: description: "Trusted CA certificate that was used to sign the vxlan policy agent's client cert and key." server_cert: -   description: "Server certificate for TLS. Must have common name that matches the Consul DNS name of the policy server, eg `policy-server.service.cf.internal`." +   description: "Server certificate for TLS. Must have common name that matches the Bosh DNS name of the policy server, eg `policy-server.service.cf.internal`." server_key: description: "Server key for TLS." </pre> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |         | <pre> diff --git a/jobs/policy-server/spec b/jobs/policy-server/spec index 0d9f5157..8e2ccfa8 100644 --- a/jobs/policy-server/spec +++ b/jobs/policy-server/spec @@ -101,7 +101,7 @@ properties: description: "Trusted CA for UAA server." uaa_hostname: -   description: "Host name for the UAA server. E.g. the service advertised via Consul DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." +   description: "Host name for the UAA server. E.g. the service advertised via Bosh DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." default: uaa.service.cf.internal uaa_port: ``` ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.44.0...v3.45.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.44.0...v3.45.0</a> ## Resources - [Download release 3.45.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.45.0). </pre> |
| cflinuxfs3            | 0.387.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| cflinuxfs4            | 1.82.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| credhub               | 2.12.66 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component                       | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego                           | 2.96.0  | <p>▼ v2.96.0</p> <pre> ## Changes - Bump to golang 1.21.8 - Golang package dependency bumps - Includes moving from docker v20 to docker v26 - Includes moving from pgx v3 to pgx v5 - Remove references to Consul from boshrelease + documentation - Many fixes to remove deprecated code and otherwise fix linter violations.  ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.95.0...v2.96.0">https://github.com/cloudfoundry/diego-release/compare/v2.95.0...v2.96.0</a>  ## Resources - [Download release 2.96.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.96.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.96.0</a>). </pre> |
| dotnet-core-offline-buildpack   | 2.4.26  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| garden-runc                     | 1.51.0  | <p>▼ v1.51.0</p> <pre> ## Changes - Bumped Golang to 1.21.8 - Golang package dependency bumps - Many updates to get codebase passing the staticcheck linker - Updated garden-integration-tests to be a little less flakey  ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.50.0...v1.51.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.50.0...v1.51.0</a>  ## Resources - [Download release 1.51.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.51.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.51.0</a>). </pre>                                                                              |
| go-offline-buildpack            | 1.10.17 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| java-offline-buildpack          | 4.67.1  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| java-native-image-cnb-buildpack | 0.10.0  | <p>▼ 0.10.0</p> <pre> Components: * [buildpack v0.12.0] (<a href="https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.0">https://github.com/pivotal-cf/java-native-image-cnb-buildpack/releases/tag/v0.12.0</a>) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component         | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| log-cache         | 3.0.11   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| loggregator       | 107.0.13 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| loggregator-agent | 8.0.2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| mapfs             | 1.2.63   | <p>▼ v1.2.63</p> <pre>## Dependencies * **v2:** Updated to v2.17.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **mapfs:** Updated to v`5381efc`. For more information, see [mapfs](https://github.com/cloudfoundry/mapfs).</pre>                                                                                                                                                                                                                                                                                                                                                                                                             |
| metric-registrar  | 3.0.2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| mysql-monitoring  | 10.12.0  | <p>▼ v10.12.0</p> <pre>- Updates golang to 1.22.1 - Updates packages and dependencies - #186647418 - mysql-diag should report cluster status and disk metrics more concisely</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| nats              | 56.15.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| nfs-volume        | 7.1.59   | <p>▼ v7.1.59</p> <pre>## Changes * Bump util-linux from 2.39.3 to 2.40 (#853) ## Dependencies * **nfsbroker:** Updated to v`7bc7bb0`. For more information, see [nfsbroker](https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`15c152b`. For more information, see [nfsv3driver](https://github.com/cloudfoundry/nfsv3driver).</pre> <p>▼ v7.1.58</p> <pre>## Dependencies * **nfsbroker:** Updated to v`e850d95`. For more information, see [nfsbroker](https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`8af81b5`. For more information, see [nfsv3driver](https://github.com/cloudfoundry/nfsv3driver).</pre> |

| Component                  | Version  | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nginx-offline-buildpack    | 1.2.12   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| nodejs-offline-buildpack   | 1.8.23   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| notifications              | 69.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| notifications-ui           | 47.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| otel-collector             | 0.4.0    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| php-offline-buildpack      | 4.6.17   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| push-apps-manager-release  | 677.0.41 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| push-offline-docs-release  | 6.0.169  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| push-usage-service-release | 674.0.94 | <p>▼ v674.0.94</p> <pre>## Dependencies * **app-usage-service:** Updated to v`9af4b6b`.<br/> For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> <p>▼ v674.0.93</p> <pre>## Changes ## Dependencies * **app-usage-service:** Updated to v`4c2a77a`.<br/> For more information, see [app-usage-service] (<a href="https://github.com/pivotal-cf/app-usage-service">https://github.com/pivotal-cf/app-usage-service</a>).</pre> |
| pxc                        | 1.0.25   | <p>▼ v1.0.25</p> <pre>- Updates golang to 1.22.1<br/> - Modifies bootstrap errand behavior; bootstrap now only executes on a single pxc node, removing the need for the user to designate the specific node for execution.<br/> - Introduces property `engine_config.log_slow_verbosity` increasing the information reported in slow query logs<br/> - Updates packages and dependencies</pre>                                                                                                                                                 |
| python-offline-buildpack   | 1.8.22   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| r-offline-buildpack        | 1.2.10   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.295.0 | <p>▼ v0.295.0</p> <pre> ## Changes - Resolves #401 by reverting the removal of the deprecated BuildNameToCertificate() call - Bumps to golang 1.21.9 + golang.org/x/net 0.23.0 to patch CVE-2023-45288 ## Built with go 1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.294.0...v0.295.0">https://github.com/cloudfoundry/routing-release/compare/v0.294.0...v0.295.0</a> ## Resources - [Download release 0.295.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.295.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.295.0</a>). </pre> <p>▼ v0.294.0</p> <pre> ⚠ This release contains a known issue: gorouter will no longer present the most specific certificate match but rather the first certificate that matches. See <a href="https://github.com/cloudfoundry/routing-release/issues/401">https://github.com/cloudfoundry/routing-release/issues/401</a> for details. Upgrading to routing-release 0.295.0 is advised. ⚠ ## Changes - [Bump haproxy to 2.8.7] (<a href="https://github.com/cloudfoundry/routing-release/commit/13b39eb5185656c3557c1ab15b5b13752b2ff6d8">https://github.com/cloudfoundry/routing-release/commit/13b39eb5185656c3557c1ab15b5b13752b2ff6d8</a>) - [update templates to not refer to consul] (<a href="https://github.com/cloudfoundry/routing-release/commit/8216c056b1463bd1d7bf636a749568f70cb924d2">https://github.com/cloudfoundry/routing-release/commit/8216c056b1463bd1d7bf636a749568f70cb924d2</a>) - [Default the routing_api.enabled_api_endpoints to mtls] (<a href="https://github.com/cloudfoundry/routing-release/commit/2e96c2c932f7f945c3c7c15a768d0afffc80de446">https://github.com/cloudfoundry/routing-release/commit/2e96c2c932f7f945c3c7c15a768d0afffc80de446</a>) - [Update template test for mTLS routing api default] (<a href="https://github.com/cloudfoundry/routing-release/commit/469d9e0a4eb0ac6015695ba27c6da80576b29801">https://github.com/cloudfoundry/routing-release/commit/469d9e0a4eb0ac6015695ba27c6da80576b29801</a>) - [Upgrade cf-cli-8-linux] (<a href="https://github.com/cloudfoundry/routing-release/commit/b19a25052ed7982c83524ac87d22ed2f316201a2">https://github.com/cloudfoundry/routing-release/commit/b19a25052ed7982c83524ac87d22ed2f316201a2</a>) ## Bosh Job Spec changes: ```diff diff --git a/jobs/routing-api/spec b/jobs/routing-api/spec index 1d7efe3c..2e5cd361 100644 --- a/jobs/routing-api/spec +++ b/jobs/routing-api/spec @@ -95,7 +95,7 @@ properties: routing_api.enabled_api_endpoints: description: "Protocols that the routing api will listen on. Possible values: 'mtls', or 'both' (mTLS + HTTP)" </pre> |

| Component                 | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|---------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                           |         | <pre> -     default: "both" +     default: "mtls" routing_api.mtls_port: description: "Port on which Routing API is running, listening with mTLS." default: 3001 ``` ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.293.0...v0.294.0">https://github.com/cloudfoundry/routing-release/compare/v0.293.0...v0.294.0</a> ## Resources - [Download release 0.294.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.294.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.294.0</a>). </pre> |  |
| ruby-offline-buildpack    | 1.10.11 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| web-servers-cnb-buildpack | 0.11.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.45.0  | <p>▼ v3.45.0</p> <pre> ## Changes - Fixes to stop using deprecated code in tests (`net.Error.Temporary()`) - Remove consul references from documentation - Fix issues bumping the code.cloudfoundry.org/executor package - Go package bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/silk-controller/spec b/jobs/silk-controller/spec index a0966a01..cc7529a8 100644 --- a/jobs/silk-controller/spec +++ b/jobs/silk-controller/spec @@ -45,11 +45,11 @@ properties: default: 46455 health_check_port: -   description: "Health check port for silk controller. Used by the Consul DNS health check." +   description: "Health check port for silk controller. Used by the Bosh DNS health check." default: 19683 health_check_timeout_seconds: -   description: "Health check timeout for Consul DNS." +   description: "Health check timeout" default: 5 listen_ip: @@ -64,7 +64,7 @@ properties: description: "Trusted CA certificate that was used to sign the silk daemon client cert and key." server_cert: -   description: "Server certificate for TLS. Must have common name that matches the Consul DNS name of the silk controller, eg silk-controller.service.cf.internal" +   description: "Server certificate for TLS. Must have common name that matches the Bosh DNS name of the silk controller, eg silk-controller.service.cf.internal" server_key: description: "Server key for TLS." diff --git a/jobs/silk-daemon/spec b/jobs/silk-daemon/spec index 7a1525b3..e3786357 100644 --- a/jobs/silk-daemon/spec +++ b/jobs/silk-daemon/spec @@ -70,7 +70,7 @@ properties: default: 3457 silk_controller.hostname: -   description: "Host name for the silk c </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ontroller. E.g. the service advertised via C onsul DNS. Must match common name in the silk_ controller.server_cert" +   description: "Host name for the silk c ontroller. E.g. the service advertised via B osh DNS. Must match common name in the silk_ controller.server_cert" default: "silk-controller.service.cf.intern al" silk_controller.listen_port: diff --git a/jobs/vxlan-policy-agent/spec b/jobs/vxlan-policy-agent/spec index 3118022b..802f04bb 100644 --- a/jobs/vxlan-policy-agent/spec +++ b/jobs/vxlan-policy-agent/spec @@ -41,7 +41,7 @@ properties: default: false policy_server.hostname: -   description: "Host name for the policy server. E.g. the service advertised via Cons ul DNS. Must match common name in the policy_ server.server_cert" +   description: "Host name for the policy server. E.g. the service advertised via Bosh DNS. Must match common name in the policy_se rver.server_cert" default: "policy-server.service.cf.interna l" policy_server.internal_listen_port: ``` ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.44.0...v3.4 5.0">https://github.com/cloudfoundry/silk-release/compare/v3.44.0...v3.4 5.0</a> ## Resources - [Download release 3.45.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/silk-release?version=3.45.0). </pre> |

| Component                    | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume                   | 3.1.61  | <p>▼ v3.1.61</p> <pre> ## Dependencies * **v2:** Updated to v2.17.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.32.0. For more information, see [gomega](https://github.com/onsi/gomega). * **smbbroker:** Updated to v`bab4864`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`7f3242d`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver). </pre> |
| smoke-tests                  | 4.8.5   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| staticfile-offline-buildpack | 1.6.11  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| statsd-injector              | 1.11.39 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| syslog                       | 12.2.3  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| system-metrics-scrapers      | 4.0.7   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| uaa                          | 77.4.0  | <p>▼ v77.4.0</p> <pre> ## What's Changed ### New UAA * Bump to [UAA v77.4.0](https://github.com/cloudfoundry/uaa/releases/tag/v77.4.0) ### Dependency Bumps * Bump github.com/cloudfoundry/bosh-utils from 0.0.452 to 0.0.453 in /src/acceptance_tests by @dependabot in https://github.com/cloudfoundry/uaa-release/pull/834 **Full Changelog**: https://github.com/cloudfoundry/uaa-release/compare/v77.3.0...v77.4.0 </pre>                                                                        |
| tanzu-jammy-stack            | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## TAS for VMs v6.0 Breaking Changes

This page lists breaking changes when upgrading VMware Tanzu Application Service for VMs to v6.0.

### Default stacks no longer include cflinuxfs3

New installations of TAS for VMs v6.0 no longer default to include cflinuxfs3 in the list of stacks. Operators can continue to [Configure Cloud Controller](#) to install cflinuxfs3, if desired.

Upgrading an existing foundation to TAS for VMs v6.0 does not remove cflinuxfs3. Apps running on cflinuxfs3 continue to run as normal, and developers can continue to push applications using the cflinuxfs3 stack. However, if operators [remove cflinuxfs3](#) from an existing foundation, then cflinuxfs3 is no longer installed when deploying TAS for VMs, unless the default stack list is configured to include cflinuxfs3 (see above).

Support for the cflinuxfs3 stack is deprecated and will be removed in a future release of TAS for VMs. If you have not already, migrate all applications off of cflinuxfs3 and remove the stack from your foundations.

## Absolute CPU Entitlement metrics no longer available

The `absolute_entitlement` and `absolute_usage` metrics are no longer emitted for each container. They are replaced by the `cpu_entitlement` metric. If you have any dashboards that reference the `absolute_entitlement` and `absolute_usage` metrics, update the dashboards to use the new metric.

Due to the removal of these metrics, the experimental CPU Entitlement Plug-in no longer functions. If you use this plug-in to view CPU entitlement usage, you can instead view the `cpu_entitlement` metric, for example using the Log Cache cf CLI plug-in.

## Breaking changes if you are starting from TAS 5.0

If you are upgrading from TAS 5.0 to TAS 6.0, review the following breaking changes to ensure a smooth upgrade.

### Change: gorouter enforces stricter content-length headers when transfer-encoding header is set

Versions Introduced

| Product    | TAS           |
|------------|---------------|
|            | <b>4.0.30</b> |
| Version(s) | 6.0.10        |
|            | <b>10.0.0</b> |

#### Why Should I Be Concerned About This Change?

go version 1.23 introduced a security enhancement which now checks if the content-length header is valid when the transfer-encoding header is set. Previously the content-length header was ignored and allowed the response to pass through. This change is desirable as it prevents an attacker from performing request smuggling or response splitting.

#### How Can I Tell If I'm Impacted?

After upgrading gorouter will return http status 502 when a response has an invalid content-length header and the transfer-encoding header is set.

#### What Should I Do About It?

This KB [Gorouter returns 502 error when apps returns http status 200 with invalid content length](#) has more information about symptoms and why it is important to fix apps which are sending invalid content-length headers.

## App Autoscaler API requires JRE 17

Versions Introduced

| Product    | TAS            |
|------------|----------------|
|            | <b>2.11.37</b> |
| Version(s) | <b>2.13.19</b> |
|            | <b>3.0.9</b>   |
|            | <b>4.0.1</b>   |

### Why Should I Be Concerned About This Change?

The App Autoscaler API may error during deployment due to it now requiring JRE 17.

### How Can I Tell If I'm Impacted?

You are impacted if you have customized the java offline buildpack to use a JRE other than OpenJDK and the default JRE version in the buildpack or defined by an environment variable group is not JRE 17.

You are likely impacted if the following line appears in the logs for the autoscale-api application:

```
ERR java.lang.UnsupportedClassVersionError:  
org/springframework/boot/loader/JarLauncher has been compiled by a more  
recent version of the Java Runtime (class file version 61.0), this version of the Java  
Runtime only recognizes class file versions up to 55.0
```

### What Should I Do About It?

Ensure that JRE 17 is available in your java offline buildpack.

If the java runtime you are using is the Oracle JRE, then upgrade to a version of TAS that ships with cf-autoscaling version 249.2.6. As of that version of cf-autoscaling, the autoscale-api application configures [JBP\\_CONFIG\\_ORACLE\\_JRE](#) to self-select Oracle JRE 17.

Alternatively, customers can temporarily override their buildpack defaults in order to run the `deploy-autoscaler` errand:

1. Set an environment variable group that changes the default version of Java to 17 across all applications in a foundation, e.g.

```
$ cf set-staging-environment-variable-group '{"JBP_DEFAULT_OPEN_JDK_JRE":{"jre:  
{version: 17.+ }}}'
```

2. Generate the correct parameters for your java runtime by viewing the options available in the [java buildpack](#). Also be careful to merge your new parameters with any parameters already set in the environment variable group.

3. Trigger the deploy-autoscaler errand and see it succeed.
4. Remove the parameters that you added to the environment variable group and re-set the remaining parameters to undo your changes.

## Background

The App Autoscaler API was bumped to JRE 17. Affected versions set the required JRE version with an OpenJDK JRE specific environment variable.

## Spring Boot 3 & Java Buildpack AutoReconfiguration

### Versions Introduced

| Product    | TAS         |
|------------|-------------|
| Version(s) | <b>2.11</b> |
|            | <b>2.13</b> |
|            | <b>3.0</b>  |
|            | <b>4.0</b>  |
|            | <b>5.0</b>  |

### Why Should I Be Concerned About This Change?

The Spring AutoReconfiguration library supplied by the buildpack is deprecated, as well as the Spring Cloud Connectors project. It is recommended to use the [java-cfenv](#) library instead for accessing bound services in Spring Boot apps. To make it easier to migrate to this library, the Java Buildpack will now install the Java CfEnv library for Spring Boot 3 apps only, and the Spring AutoReconfiguration library will no longer be installed for these apps.

### How Can I Tell If I'm Impacted?

Apps may be affected if they have already been migrated to Spring Boot 3 and are relying on Spring Autoreconfiguration, i.e.

1. You have not set the variable `JBP_CONFIG_SPRING_AUTO_RECONFIGURATION '{enabled: false}'`
2. The app is bound to a service of one of these types:
  - Cassandra
  - Relational Database
  - RabbitMQ
  - Mongo DB
  - Redis
  - SMTP
3. The startup logs for the app will show a log entry such as '`dataSource`' bean of type with '`javax.sql.DataSource`' reconfigured with '`mysql`' bean

Apps using Spring Boot 2.x will continue to receive the Spring AutoReconfiguration library and should not be affected by this change.

### What Should I Do About It?

In most cases, the Java CfEnv library should replace the functionality of the Spring Autoreconfiguration library for Spring Boot 3 apps. The Java CfEnv library examines bound services of the above types (except SMTP) and sets well-known Spring Boot properties so that Spring Boot's Autoconfiguration can kick-in.

### Background

The Spring AutoReconfiguration library uses the Spring Cloud Connectors project which has been deprecated since 2019. Java CfEnv is the recommended library for accessing bound services.

## UAA's SAML IdP functionality removed

### Why Should I Be Concerned About This Change?

UAA's ability to act as a SAML identity provider has been removed in preparation for replacing its dependency on Spring SAML Extension with Spring Security SAML 2 support. You can no longer use UAA as your SAML IdP.

Note that UAA's ability to integrate with an upstream SAML identity provider as a SAML service provider is unaffected by this change.

### How Can I Tell If I'm Impacted?

If you use UAA as a SAML IdP, you are impacted. If you are unsure, get the list of registered SAML service providers from UAA's "/saml/service-providers" endpoint. (See

<https://docs.cloudfoundry.org/api/uaa/version/76.31.0/#list>.) If you get a non-empty list in response, then you are using UAA as a SAML IdP.

Note that "/saml/service-providers" endpoint has been also removed from the latest UAA version as part of the SAML IdP functionality removal.

### What Should I Do About It?

UAA now supports acting as an identity provider over OIDC. If the system that acts as a SAML service provider can also integrate with OIDC identity providers, you should switch it to use that protocol instead.

### Background

Spring SAML Extension has reached the end of support. UAA is replacing it with Spring Security SAML 2 support to keep the SAML feature compatible with latest Spring versions. Since Spring Security does not provide Identity Provider support, UAA is dropping its SAML IdP functionality.

## Local UAA password policy configuration changed

### Why Should I Be Concerned About This Change?

If you have customized the password policy settings for local UAA users, these settings will be restored to the default policy unless you take action.

#### How Can I Tell If I'm Impacted?

If you currently have configured the local UAA user password policy by setting the fields under the “Internal user store” option in the Authentication and Enterprise SSO pane, then your existing settings will be affected.

#### What Should I Do About It?

You can instead configure the password policies for local UAA users in a new section on the UAA pane of the TAS tile. This configuration section is available in TAS 4.0 and 5.0 and will be preserved in the upgrade to 6.0.

#### Background

In previous TAS versions, the local UAA password policies could be configured only if you selected the Internal user store option in the Authentication and Enterprise SSO pane. The local UAA password policy configuration option is now moved to the UAA pane, where you can customize the settings regardless of the Authentication and Enterprise SSO option you chose.

## Gorouter uses port 7070 by default for internal route services instead of a random available port

#### Why Should I Be Concerned About This Change?

This change is only relevant to foundations with third-party services listening on port 7070.

#### How Can I Tell If I'm Impacted?

SSH into a router VM and use `lsof -Pi` to determine if port 7070 is being used. Be sure to check any routers deployed by IST as well.

#### What Should I Do About It?

If your foundation is impacted, use Tanzu Operations Manager to configure use of a different port.

For TAS, go to the Networking tab and scroll down to the Route Services section. If route services are enabled, you will see a text box labeled “The port used for internal route services requests.” Set the value to a known available port, or set the value to 0 to allow the operating system to choose an available port at deploy time.

For IST, go to the Networking tab and scroll down to the text box labeled “The port used for internal route services requests.” Follow the same instructions as you did for TAS.

## Breaking changes if you are starting from TAS 4.0

### MySQL 5.7 external system database support removed

## Why Should I Be Concerned About This Change?

Your TAS deployment will fail or become insecure if you are using MySQL 5.7 as TAS's external system database, as MySQL 5.7 will soon reach End-Of-Life.

## How Can I Tell If I'm Impacted?

You are impacted if you have configured a MySQL 5.7 database instance as the external system database for your TAS deployment. You can check your current system database settings by selecting "Databases" pane in the TAS for VMs tile. If under "System databases location" section, the "External database server" option is selected and the configured database server is based on MySQL 5.7, you are impacted.

## What Should I Do About It?

Upgrade your external system database to a supported MySQL version (such as MySQL 8.0).

### Background

This change was triggered by the fact that as MySQL 5.7 reaches its official End-Of-Life date (31 Oct 2023), many TAS components as well the database client libraries that they depend on will follow suit to remove support and testing for MySQL 5.7.

## NATS intentionally fails deployment in post-start in v1

### Why Should I Be Concerned About This Change?

Operators can ensure successful deployment of NATS servers, which propagate routes from services and apps to Gorouter, by confirming that their nats-release instances have successfully migrated to NATS v2.

### How Can I Tell If I'm Impacted?

If your TAS environment is already on v2.11.26 or greater, make sure that your NATS instances have successfully migrated by checking that NATS 2.0 is running (see KB article in link).

### What Should I Do About It?

If your deployment fails, check nats instance logs. Migration details, including any possible error messages, can be found under `/var/vcap/sys/log/nats-tls/nats-tls-wrapper.stdout.log`

### Background

In TAS v2.11.26, nats-release upgraded its underlying software package from NATS 1.0 (package name `gnatsd`) to NATS 2.0 (package name `nats-server`). The nats-release contains NATS 1.0, which will start as a fallback in case the migration to NATS 2.0 fails. In preparation for the future removal of NATS 1.0, nats-release will fail in post-start if it detects that NATS 1.0 is running instead of NATS 2.0.

### Links

- [How to confirm your nats servers are running NATS v2](#)

## App Autoscaler API no longer accepts trailing slashes

### Why Should I Be Concerned About This Change?

Existing clients of the App Autoscaler API may break if they make requests to resources including trailing slashes.

### How Can I Tell If I'm Impacted?

If you have written code that makes requests to the App Autoscaler API with trailing slashes or have documentation that describes making requests with trailing slashes you are impacted.

Requests that specify trailing slashes will now receive a 404 response.

This does not affect users who are using the autoscaler cf CLI plugin.

### What Should I Do About It?

Modify your client or documentation to no longer make requests with trailing slashes.

### Background

This is a Spring Framework default change to improve security posture:

<https://github.com/spring-projects/spring-framework/issues/28552>

## Logging timestamp format changed for some TASW jobs

### Why Should I Be Concerned About This Change?

Existing automation that parses logs from TASW components may break if they are still expecting timestamps formatted as epoch time. Specifically, logs from `groot` and `garden_windows` have been converted to RFC 3339 timestamps.

### How Can I Tell If I'm Impacted?

You are impacted if you have log parsing for TASW's `groot` and `garden_windows` jobs that rely on timestamps being in epoch format.

### What Should I Do About It?

If it was necessary to adjust log parsing for TAS/TASW 4.0 to account for the change in timestamp format, update log parsing in the same manner, but for the TASW `groot` and `garden_windows` jobs.

### Background

Non-standardized and non-human readable timestamps in logs make debugging TAS more difficult. Starting in TAS/TASW 4.0, timestamps have been logged using RFC 3339 format in all cases but `groot` and `garden_windows`.

## Logging timestamp format property removed

### Why Should I Be Concerned About This Change?

Existing automation that configures a log timestamp format will break if product config is not updated.

### How Can I Tell If I'm Impacted?

You are impacted if you set the `logging_timestamp_format` product config property.

### What Should I Do About It?

This property has had no effect since TAS 4.0. Update your configuration to no longer specify the property.

#### Background

Non-standardized and non-human readable timestamps in logs make debugging TAS more difficult.

## Syslog Aggregate Drains property changes

### Why Should I Be Concerned About This Change?

Existing automation that configures aggregate syslog drains will break if product config is not updated.

### How Can I Tell If I'm Impacted?

You are impacted if you have configured aggregate syslog drains with the `syslog_agent_aggregate_drains` property.

### What Should I Do About It?

References to the old property should be updated to refer to the new `mtls_syslog_agent_aggregate_drains` property.

This property is used to define aggregate syslog drains with keys and certificates for Mutual TLS, as well as to define aggregate drains that are not using Mutual TLS.

Comma-separated strings are no longer accepted, instead pass an array of aggregate drains:

```
.properties.mtls_syslog_agent_aggregate_drains:
value:
- url: syslog-tls://HOSTNAME:PORT
- url: syslog-tls://ANOTHER-HOSTNAME:PORT
```

Additionally, consider if your syslog aggregate drains should be updated to use Mutual TLS.

#### Background

From TAS 5.0 operators can configure aggregate drains that support Mutual TLS for improved security. This necessitated changing the structure of the syslog aggregate drains property to allow these new fields to be specified.

## Metrics Agent deprecated and defaults to off

### Why Should I Be Concerned About This Change?

The behavior of any custom integration using Prometheus to scrape the Metrics Agent will change. The Metrics Agent is protected by mutual TLS, and would require using a certificate issued by TAS to access. We do not know of any products or integrations which use this agent.

### How Can I Tell If I'm Impacted?

You would have built a custom integration which scrapes all VMs via Prometheus on port 14726.

### What Should I Do About It?

If you are using the Metrics Agent, it is possible in TAS 5.0 to re-enable it by unchecking the checkbox in the System Logging configuration page. We would encourage you instead to switch to using the Prometheus Exporter in the OpenTelemetry Collector. If you

are unable to migrate to the Prometheus Exporter please let VMware know as the Metrics Agent is slated for removal in TAS 6.0.

### Background

The Metrics Agent was designed as a way for Healthwatch and other components to retrieve metrics without using the Loggregator Firehose. No components ended up adopting it, and with the introduction of the OpenTelemetry Collector we have much more flexible options for egress metrics so are slating this for removal instead of driving adoption towards it.

## Breaking changes if you are starting from TAS for VMs v3.0

If you are upgrading from TAS v3.0 to TAS v6.0, review the following breaking changes to ensure a smooth upgrade.

### Components logs always use Human-Readable RFC 3339 Timestamp Format

#### Why Should I Be Concerned About This Change?

From TAS 4.0.0 components logs are always output with RFC 3339 timestamps.

#### How Can I Tell If I'm Impacted?

Check the “System Logging” pane in the TAS configuration. If “Timestamp format for component logs” is set to “Maintain previous format” then you are impacted.

The corresponding product configuration is where `.properties.logging_timestamp_format` is set to `deprecated`.

#### What Should I Do About It?

If you have systems that rely on the old timestamp format for component logs when parsing log lines then these will need to be updated to handle the RFC 3339 timestamp format.

## Background

Non-standardized and non-human readable timestamps in logs make debugging TAS more difficult.

## Option to Enable (Beta) Log Rate Limit Removed

### Why Should I Be Concerned About This Change?

The option to set a global app log rate limit in TAS/IST/TASW was removed.

If you were using this feature to limit your overall app log throughput, then you may see an increase in log load after upgrading.

### How Can I Tell If I'm Impacted?

If you have enabled the App log rate limit option in the TAS/IST/TASW “App Containers” tab then you are impacted.

### What Should I Do About It?

You should look to replace use of this feature with org, space, and app, byte-based log rate limits. For details, see [App Log Rate Limits](#).

If you are impacted and concerned about log load in your system during, and after, upgrading, consider either:

- Scaling up your logging system before upgrading to TAS v4.0 to compensate for the increased log load.
- Upgrading to TAS v3.0 first to set app-level log rate limits while retaining the global app log rate limit.

## Background

Since the introduction of org, space, and app log rate limits in TAS v3.0, this feature was moved from beta to deprecated.

## Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#breaking-changes>
- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/app-log-rate-limits.html>

## Recent logs endpoint removed from traffic controller

### Why Should I Be Concerned About This Change?

This will cause versions of the cf CLI before v6.52.0 to no longer be able to retrieve logs when called with `cf logs --recent`.

### How Can I Tell If I'm Impacted?

If you have users or automation that are using cf CLI versions that are older than v6.52.0, they are impacted.

### What Should I Do About It?

Upgrade clients to a newer version of the cf CLI.

### Background

The cf CLI has been using Log Cache as the source for `cf logs --recent` since v6.52.0. This change is removing a deprecated path for log retrieval. cf CLI v6 is not compatible with TAS 2.13 or higher, this is a special notice of removal.

### Links

## Add validation for CAs trusted by Gorouter

### Why Should I Be Concerned About This Change?

If you have invalid CA certificates listed in your Ops Manager and TAS configurations, you will need to update these in order to deploy TAS 4.0.

### How Can I Tell If I'm Impacted?

Any entries that are not valid for CA certificates cause an error in Ops Manager. You must remove or replace invalid entries.

Check any CA certs specified in your Director or TAS tiles against `openssl x509 -text -in <cert-file>`. If any errors are returned, you should fix or regenerate the certificate.

### What Should I Do About It?

Replace the invalid CA certificates with up-to-date and valid certificates. Alternatively, if there is no replacement, simply remove the invalid CA certificate.

### Background

Previously, Gorouter and Opsmanager would ignore the invalid certificates. This change has been made to help make operators aware of any copy/paste problems when applying CA certificates.

### Links

## Max request header size now defaults to 48 kb

### Why Should I Be Concerned About This Change?

If end-users are sending requests with large request headers to your environment, they may now experience 431 status code errors.

### How Can I Tell If I'm Impacted?

You will see 431 status code in your gorouter access logs, with the `X-Cf-RouterError: max-request-size-exceeded` response header set.

### What Should I Do About It?

If you want to accommodate large request headers, you can increase the default size in the [Networking](#) tab of Ops Manager under the field `Maximum request header size`. We do not recommend this accommodation as a long-term option.

### Background

**NOTE:** This limit is specifically for the Method, Request URI, and protocol line of an HTTP request, as well as any HTTP Headers in the request.

Max request header size now defaults to 48 kb. Upgrading to 4.0 sets the Max request header size in kb to 48, unless the existing configuration was already lower. Lowering this value establishes a better security posture; large request headers could consume router resources or leak memory.

## Ruby Buildpack 1.9.0 defaults to Ruby 3.1

### Why Should I Be Concerned About This Change?

If your apps haven't been upgraded to be compatible with Ruby 3.1, you may experience errors.

### How Can I Tell If I'm Impacted?

You will see app errors, logged in

```
cf logs [APP NAME] --recent
```

### What Should I Do About It?

Update your apps to be compatible with Ruby 3.1. If you need a temporary workaround while upgrading apps, you can upload both the Ruby Buildpack 1.9.0 as well as a previous buildpack to your environment until apps have been upgraded and the previous buildpack can be removed.

### Background

### Links

- <https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=298293>

## Viewing Custom iptables Rules Requires /sbin/iptables Binaries

## Why Should I Be Concerned About This Change?

If you create custom iptables rules on your Diego cells, they may not be visible when running `iptables -L` because we have upgraded the default version of iptables. However these custom rules do still apply.

## How Can I Tell If I'm Impacted?

You can see any custom rules you have by running `iptables-legacy`, to evoke iptables 1.6.x.

## What Should I Do About It?

Update your custom iptables logic to use the `/sbin/iptables*` binaries, which run iptables 1.8.x (backed by nftables).

If you need to interact with your custom rules before upgrading, you can use the command `iptables-legacy` as a short-term workaround.

## Background

On the Jammy Jellyfish stemcell, the `iptables` command uses the nftables framework (1.8.x) instead of the `iptables` firewall (1.6.x). We made garden default to using the system `iptables` binary. However, we make both versions available to make custom `iptables` rules accessible in the short-term.

## Links

- <https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=298293>

## Breaking changes if you are starting from TAS for VMs v2.13

If you are upgrading from TAS v4.0 to TAS v6.0, review the following breaking changes to ensure a smooth upgrade.

### App logs that exceed rate limit are dropped immediately

#### Versions Introduced

| Product    | TAS     | Isolation Segment | TAS Windows |
|------------|---------|-------------------|-------------|
| Version(s) | 2.11.26 | 2.11.20           | 2.11.20     |
|            | 2.12.18 | 2.12.13           | 2.12.12     |
|            | 3.0.0   | 3.0.0             | 3.0.0       |

#### Why Should I Be Concerned About This Change?

The behavior of line-based application log rate limiting has changed. Previously application logs would be buffered to some extent and then released at the configured rate. Now application logs that exceed the rate limit are dropped immediately.

## How Can I Tell If I'm Impacted?

You are impacted if you have configured the deprecated line-based application log rate limiting and have applications that emit logs in excess of the configured limit.

## What Should I Do About It?

This is expected behavior and helps ensure that logs that are output are timely. VMware recommends use of quota-based log rate limits for fine-grained control over application log rates.

## Background

This behavior was modified as part of changes to Diego to support granular log rate limits on orgs, spaces and individual apps in TAS 3.0.

## Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#2-13-10>

## Syslog Drains reject SHA-1 certificates

### Versions Introduced

| Product    | TAS            | Isolation Segment | TAS Windows    |
|------------|----------------|-------------------|----------------|
| Version(s) | <b>2.11.19</b> | <b>2.11.13</b>    | <b>2.11.13</b> |
|            | <b>2.12.12</b> | <b>2.12.7</b>     | <b>2.12.7</b>  |
|            | <b>2.13.5</b>  | <b>2.13.2</b>     | <b>2.13.2</b>  |
|            | <b>3.0.0</b>   | <b>3.0.0</b>      | <b>3.0.0</b>   |
|            | <b>4.0.0</b>   | <b>4.0.0</b>      | <b>4.0.0</b>   |

### Why Should I Be Concerned About This Change?

System Logging will be impacted if older SHA-1 hash function certificates are used.

## How Can I Tell If I'm Impacted?

Review your configured application syslog drains. If you have a certificate for a syslog drain configured with a SHA-1 hash, you are impacted.

## What Should I Do About It?

Regenerate impacted certificates so that they don't use the SHA-1 hash function.

## Background

Logging components provided by loggregator-agent-release have been upgraded to Go 1.18. From Go 1.18 the treatment of certificates is stricter and certificates signed with the SHA-1 hash function will be rejected. Go stopped accepting certificates signed with the SHA-1 hash function because of security concerns.

## Links

- <https://go.dev/doc/go1.18#sha1>

## Application log rate limit default

### Versions Introduced

| Product    | TAS   |
|------------|-------|
| Version(s) | 3.0.0 |
|            | 4.0.0 |

### Why Should I Be Concerned About This Change?

Applications pushed to TAS 3.0+ will inherit a default operator-configurable log rate limit if one is not specified.

### How Can I Tell If I'm Impacted?

You are impacted if you are upgrading to TAS 3.0+ and are pushing applications to the platform. Applications that already exist on the platform prior to upgrade will default to not being log rate limited.

### What Should I Do About It?

Determine if the default log rate for new applications (16 K/s) is appropriate for your needs. If you have applications with verbose logs exceeding the default limit and do not wish their logs to be dropped for exceeding the limit then consider:

- pushing your applications with a specified app log rate limit
- modifying the platform default log rate limit

The default log rate limit for new applications is configurable in the “App Developer Controls” tab in the TAS product configuration. The corresponding property is

`.properties.cloud_controller_default_log_rate_limit_app.`

### Background

The ability to set the log rate limit in a granular way is intended to allow operators to protect both the logging system within TAS and external integrations that receive logs. Setting a platform default limit for new applications makes it more likely that applications will have a log rate limit set allowing quotas to be imposed.

## Autoscaler service bindings duplicate index

### Versions Introduced

| Product    | TAS                                               |
|------------|---------------------------------------------------|
| Version(s) | <b>2.11.20</b><br><b>2.12.13</b><br><b>2.13.5</b> |

### Why Should I Be Concerned About This Change?

Upgrading to a version of TAS that introduces a new database index for App Autoscaler on the service bindings table may error if you have previously manually created the same index.

### How Can I Tell If I'm Impacted?

You are impacted if you have previously manually added a database index following the instructions in the knowledge base article Autoscale application fails with MySQL Deadlock errors and are upgrading to one of the following TAS versions:

- 2.13.5
- 2.13.6

### What Should I Do About It?

Upgrade to a newer patch release of TAS that does not have this limitation.

### Background

An error was made in the implementation of the database migration that meant that an attempt was made to add the database index despite it already existing in the database.

### Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#2-13-5>
- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#2-13-7>
- <https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=298085>

## BOSH System Metrics Forwarder Removed

### Versions Introduced

| Product    | TAS                          |
|------------|------------------------------|
| Version(s) | <b>3.0.0</b><br><b>4.0.0</b> |

### Why Should I Be Concerned About This Change?

The BOSH System Metrics Forwarder is removed from TAS for VMs

### How Can I Tell If I'm Impacted?

You are impacted if you have been using the deprecated BOSH System Metrics Server and Forwarder. You are using the BOSH System Metrics Server if you have selected the “Enable BOSH System Metrics Server (deprecated)” option in the Ops Manager Director product configuration.

### What Should I Do About It?

To continue receiving system metrics, you must select the “Enable System Metrics” checkbox in the Director Config pane of the BOSH Director tile.

To avoid deployment, platform automation, or data collection failures, you must update any queries that reference `bosh-system-metrics-forwarder` as the `source_id` for metrics to reference `system_metrics_agent` instead.

Additionally, metric names now include underscores instead of periods. For example, the metric named `system.cpu.sys` in previous versions of TAS for VMs is named `system_cpu_sys` in TAS for VMs v3.0.

### Background

BOSH System Metrics Server and Forwarder are deprecated in favor of System Metrics server and scraper.

### Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-operations-manager/3-0/tanzu-ops-manager/release-notes.html#bosh-system-metrics-server-is-removed-19>

## HAProxy removed

### Why Should I Be Concerned About This Change?

If your environment was running an HAProxy instance group, you must reconfigure your networking configurations or else will get a deployment error when upgrading to TAS 3.0.

### How Can I Tell If I'm Impacted?

To check if you are running HAProxy, open the Networking tab in Ops Manager. Under the field “Routing TLS Termination”, you’ll see “HAProxy”.

### What Should I Do About It?

Change your networking and resource configurations to point directly to Gorouter. Full directions are in the “HAProxy Removed” doc above.

### Background

HAProxy was previously supported as an instance group in front of gorouter in order to support features not offered by gorouter. Now that gorouter supports TLS termination, HAProxy is no longer needed.

## Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#haproxy-removed>
- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/frontend-idle-timeout.html>

## Log Cache nozzle ingress removed

### Versions Introduced

| Product    | TAS   |
|------------|-------|
| Version(s) | 3.0.0 |
|            | 4.0.0 |

### Why Should I Be Concerned About This Change?

From TAS 3.0.0 Log Cache uses syslog ingress, and the option to use nozzle ingress has been removed.

### How Can I Tell If I'm Impacted?

You are impacted if you have not checked the “Enable Log Cache syslog ingestion” option, or set the corresponding `.properties.enable_log_cache_syslog_ingestion` product property to `false`. From TAS 3.0.0 this is no longer a supported configuration.

In addition Diego Cells with high logging volume might experience higher CPU usage than they did prior to this change.

### What Should I Do About It?

Confirm that your instances, including those within isolation segments, are permitted to establish connections to Log Cache nodes on port 6067. You may need to update firewall rules to allow logs to flow directly from your instances to the Log Cache syslog server.

Consider scaling your Diego Cells if you have applications with high logging volume due to the increased load from the syslog agent on the Diego Cell.

### Background

Log Cache ingestion via the Reverse Log Proxy (RLP) has been removed.

## ActiveLocks removed from Key Performance Indicators

### Why Should I Be Concerned About This Change?

If you were monitoring `ActiveLocks` on your environment, upgrading to TAS 3.0.0 will increase your metric by 1.

## How Can I Tell If I'm Impacted?

You are impacted if your environment Key Performance Indicators includes Locket [ActiveLocks](#).

## What Should I Do About It?

Remove this metric from any KPI monitoring you maintain.

### Background

[ActiveLocks](#) is a metric emitted by Locket, a distributed locking service used by multiple services in CloudFoundry. With the introduction of a new, opt-in service that uses Locket, the expected number of active locks increased by 1. Our community noted that a feature-dependent was a smell of a bad performance indicator; while the information is useful in debugging, it is not useful as a performance indicator and we no longer recommend monitoring it as an environment health metric.

### Links

## cflinuxfs4 as default stack may cause failures to push apps

### Why Should I Be Concerned About This Change?

cflinuxfs3 (backed by Ubuntu Bionic) has been deprecated in favor of cflinuxfs4 (backed by Ubuntu Jammy). If apps are configured to use the latest stack, upgrading TAS will upgrade app stacks and may cause a push failure.

## How Can I Tell If I'm Impacted?

You can see what stack your apps are configured to use by running:

```
cf audit-stack
```

If apps are followed by [cflinuxfs3](#), they are running an outdated stack.

## What Should I Do About It?

You should re-stage your app to use [cflinuxfs4](#).

```
cf push <APP_NAME> -s cflinuxfs4
```

Resolve any push errors prior to upgrading TAS. This may entail updating the buildpack that your app uses. If fixing app staging is not possible before the TAS upgrade you can configure apps to run on [cflinuxfs3](#) as a temporary workaround.

### Background

“Stacks” are the pre-built root file system that Cloud Foundry uses to create app containers. Keeping these up-to-date with operating system updates is key to updating security vulnerabilities and other issues.

## Links

- [Managing apps and their stacks](#)
- [TAS cflinuxfs4 Migration Proposal](#) discusses stack change behaviors for each TAS release

## Diego and Routing Components More Strict With TLS Protocols

### Versions Introduced

| Product    | TAS            |
|------------|----------------|
|            | <b>2.11.27</b> |
| Version(s) |                |
|            | <b>2.12.28</b> |
|            | <b>2.13.13</b> |

### Why Should I Be Concerned About This Change?

Diego and Routing components have been updated to be more strict with TLS protocols. External services and databases, end users, and services making requests to gorouter should be using TLS 1.2 and have certs signed with a newer hash than SHA-1, or else they will experience TLS errors.

### How Can I Tell If I'm Impacted?

For services talking to Diego components, if your environment is impacted they will not be able to successfully make a connection to Diego. For external users services talking to gorouter, you should see TLS errors in your access logs.

If you are using an external database, Diego will throw errors trying to start processes like Locket and BBS.

You can check the Signature Algorithm of your external database and external services with the following command:

```
echo '' | openssl s_client -connect <HOSTNAME>:<PORT> -servername
<HOSTNAME> 2>/dev/null | openssl x509 -noout -text | grep
'Signature Algorithm'
```

You can check that TLS 1.2 is supported with the following command:

```
echo openssl s_client -connect google.com:443 -servername google.com
-tls1_2 || echo "TLS 1.2 unsupported"
```

If you see no output, TLS 1.2 is supported. If you see the TLS 1.2 unsupported message, it is unsupported and will need to be updated.

### What Should I Do About It?

Make sure that services talking to your Diego components and services talking to gorouter are not using TLS 1.0 or 1.1, or using SHA-1 certificates.

### Background

Diego and Routing components, including gorouter, use an up-to-date version of Golang. As of Golang 1.18, TLS requirements have been made more strict in two major ways. First, TLS 1.0 and 1.1 disabled in favor of TLS 1.2. Second, crypto/x509 will now reject certificates signed with the SHA-1 hash function. See Golang release notes for details.

## Links

- <https://tip.golang.org/doc/go1.18>

## Breaking changes if you are starting from TAS for VMs v2.12

### Logging stricter IP address parsing

#### Versions Introduced

| Product    | TAS     | Isolation Segment | TAS Windows |
|------------|---------|-------------------|-------------|
| Version(s) | 2.11.14 | 2.11.10           | 2.11.10     |
|            | 2.12.7  | 2.12.4            | 2.12.5      |
|            | 2.13.0  | 2.13.0            | 2.13.0      |
|            | 3.0.0   | 3.0.0             | 3.0.0       |
|            | 4.0.0   | 4.0.0             | 4.0.0       |

#### Why Should I Be Concerned About This Change?

Logging components provided by loggregator-agent-release and syslog-release have been upgraded to Go 1.17.

From Go 1.17 the treatment of IP addresses is stricter and any IP addresses where an octet starts with a leading zero is now invalid.

#### How Can I Tell If I'm Impacted?

Review your configured application syslog drains and the address of any configured syslog destination in the TAS “System Logging” tab. If your configuration contains an IP address with an octet that has a leading zero then you are impacted.

#### What Should I Do About It?

Modify your configuration to express the ip address without a leading zero.

#### Background

The Go Developers chose to disallow IP addresses with octets with leading zeros due to them presenting a security concern.

## Links

- <https://go.dev/doc/go1.17>

## System metrics scrape frequency increased

Versions Introduced

| Product    | TAS                                          |
|------------|----------------------------------------------|
| Version(s) | 2.11.8<br>2.12.1<br>2.13.0<br>3.0.0<br>4.0.0 |

### Why Should I Be Concerned About This Change?

The frequency with which system metrics are scraped increased from a fixed frequency of every 1 minute to a configurable default of every 15 seconds. This may cause increased load on your logging and metrics infrastructure.

### How Can I Tell If I'm Impacted?

If you have enabled system metrics in the Ops Manager director config and you are upgrading to a version of TAS after the versions that introduced this change then you are impacted.

You are not impacted if you are using the deprecated BOSH system metrics server instead of the recommended system metrics scraper.

### What Should I Do About It?

The default 15 second scrape frequency is recommended. You may not need to take action if your logging and metrics infrastructure is already scaled sufficiently to handle the increased number of metrics. Aside from scaling another option is to reduce the scrape frequency.

The scrape interval can be changed by modifying the `.properties.system_metrics_scraper_scrape_interval` TAS property. This property is configurable within Ops Manager under the System Logging tab as “System metrics scrape interval”.

### Background

Prior to the versions that this change was introduced the system metrics scrape interval was hard-coded to every 1 minute.

## Jobs Error interface changes in Rails 6

### Why Should I Be Concerned About This Change?

Changes internal to the Cloud Controller worker may cause `cf push` downtime during upgrade.

## How Can I Tell If I'm Impacted?

You have a significant (>100) number of `cloud_controller_worker` VMs.

## What Should I Do About It?

While there is an existing mitigation in place, it may not be sufficient for large foundations which might still experience downtime when running cf push. Please see [https://github.com/cloudfoundry/cloud\\_controller\\_ng/issues/2748](https://github.com/cloudfoundry/cloud_controller_ng/issues/2748) for more details

## Background

Rails 6 introduced a new interface for the Error class, which means Rails 5 servers cannot de-serialize the new Error class. CAPI release in TAS 2.13 contains upgrade of Ruby on Rails dependencies to Ruby on Rails 6.1 (from Ruby on Rails 5).

While upgrading Cloud Controller VMs to this release, new jobs created by API servers containing the Rails 6 upgrade may serialize the new Errors interface in the database as part of jobs for the Worker VMs to pick up. Worker VMs which have not upgraded, and are still running Cloud Controller with Rails 5, will fail to de-serialize the Error class's new interface.

## Links

- [https://github.com/cloudfoundry/cloud\\_controller\\_ng/issues/2748](https://github.com/cloudfoundry/cloud_controller_ng/issues/2748)

## cf CLI v6 not supported in 2.13

### Why Should I Be Concerned About This Change?

TAS for VMs v2.13 does not support cf CLI v6; this means that cf CLI v6 and TAS for VMs v2.13 and later are not tested together, and if you or your users encounter issues using the v6 CLI, you will need to upgrade to v7 to get effective support.

The change from cf CLI v6 to v7 (and v7 to v8) is itself a major version bump, with its own breaking changes.

Two examples:

1. the flags supported by cf push have changed, See the articles on Upgrading for more details.
2. the way quota is counted for staging apps is more conservative, and this can cause push failures. See the linked KB for details.

### How Can I Tell If I'm Impacted?

If any automation or clients targeting the platform (especially app developer pipelines, or custom service brokers) that have not already explicitly updated to cf CLI version v7 or greater.

### What Should I Do About It?

Your users must upgrade to cf CLI v7 or cf CLI v8. To upgrade to a supported cf CLI version, see Upgrading to cf CLI v7 or Upgrading to cf CLI v8.

## Background

The newer versions of the CF cli target the new v3 version of the Cloud Controller API. The cf CLI v6 relies on the deprecated v2 Cloud Controller API, which may be entirely removed in a future TAS version line.

## Links

- [TAS 2.13 Breaking Changes of CLI Release Note](#)
- [Upgrading to cf CLI v7](#)
- [Upgrading to cf CLI v8](#)

## Log Cache Uses Its Own Instance Group

### Why Should I Be Concerned About This Change?

As of TAS for VMs v2.13, the Log Cache component runs on its own Log Cache instance group, and is no longer deployed on Doppler instances. Operators should ensure they scale Log Cache appropriately.

### How Can I Tell If I'm Impacted?

You are impacted if you are upgrading to TAS 2.13.0 or higher.

### What Should I Do About It?

Scale up your Log Cache instance count. VMware recommends scaling up to match the number of VMs and amount of memory as your Doppler instances before the upgrade. Starting larger and then adjusting for actual use is safer than a deployment failure.

You can also consider reducing the memory allocation for Doppler instances now that Log Cache is no longer deployed there.

## Background

Separating Log Cache out to its own instance group allows it to be scaled independently of Dopplers and Traffic Controllers. For example, to provide more memory for storing logs and metrics.

## Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#log-metric-topology>
- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#separate-log-cache>

## Log Cache uses syslog ingress by default

### Why Should I Be Concerned About This Change?

The logging Metric topology has been changed. From TAS 2.13.0 Log Cache uses syslog ingress by default.

### How Can I Tell If I'm Impacted?

You may be impacted if you are not seeing logs and metrics from Diego Cells deployed by TAS or the Isolation Segment or Tanzu Application Service for VMs [Windows] products.

In addition Diego Cells with high logging volume might experience higher CPU usage than they did prior to this change.

### What Should I Do About It?

Confirm that your instances, including those within isolation segments, are permitted to establish connections to Log Cache nodes on port 6067. You may need to update firewall rules to allow logs to flow directly from your instances to the Log Cache syslog server.

Consider scaling your Diego Cells if you have applications with high logging volume due to the increased load from the syslog agent on the Diego Cell.

During the upgrade Diego Cells may receive the new Log Cache BOSH DNS name `log-cache.service.cf.internal` and attempt to send logs and metrics over syslog. VMware recommends upgrading to at least the following patch versions prior to the upgrade and additionally re-deploying the Isolation Segment and TAS for VMs [Windows] products so that the new Log Cache BOSH DNS name is resolvable.

- TAS for VMs v2.11.16
- TAS for VMs v2.12.9

### Background

As of TAS for VMs v2.13, the Log Cache component runs on its own Log Cache instance group, and is no longer deployed on Doppler instances. In addition, syslog ingestion was set as the default for Log Cache to use industry standard protocols.

### Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#log-metric-topology>

## Service instance metrics might not be retrievable using the Log Cache cf CLI plugin

### Why Should I Be Concerned About This Change?

Service instance metrics might not be retrievable using the Log Cache cf CLI plugin.

### How Can I Tell If I'm Impacted?

If you use the Log Cache cf CLI plugin to retrieve service instance metrics and your service tiles use log cache syslog ingestion you will be impacted.

### What Should I Do About It?

If you need to retrieve metrics from service tiles that do not support this feature:

- upgrade to a version of the service tile that allows for syslog ingestion OR
- for TAS 2.13 only, deactivate the Enable Log Cache syslog ingestion checkbox in the System Logging pane of the TAS for VMs tile. The associated product property is: `.properties.enable_log_cache_syslog_ingestion`. Note that this is a temporary solution, as this setting is no longer available in TAS 3.0.0.

### Background

As of TAS for VMs v2.13, the Log Cache component runs on its own Log Cache instance group, and is no longer deployed on Doppler instances. In addition, syslog ingestion was set as the default for Log Cache.

### Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#log-metric-topology>

## Traffic Controller unavailable during upgrade

### Why Should I Be Concerned About This Change?

V1 firehose nozzles such as the Splunk Nozzle for VMware Tanzu may fail to connect to the firehose during an upgrade.

### How Can I Tell If I'm Impacted?

You will be impacted during the upgrade if both of the following are true:

- You have a V1 firehose nozzle deployed
- You upgrading to TAS v2.13.0 - v2.13.12 or TAS 3.0.0 - 3.0.2

### What Should I Do About It?

VMware recommends that you upgrade to a more recent version of TAS that does not have this issue.

### Background

The Traffic Controller component which V1 nozzles connect to had previously blocked on startup until Log Cache was available. In TAS 2.13 Log Cache was separated out to a separate instance group meaning that Traffic Controller blocks and is unavailable until the new Log Cache instances become available.

### Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-m.html#firehose-nozzles-unavailable>

## Golang 1.17 Rejects IPv4 Addresses With Leading Zeros

### Why Should I Be Concerned About This Change?

If you have IPv4 addresses that contain decimal components leading zeros, (ie 192.168.020.100) you will receive a deploy error. You will need to reformat your IP (192.168.20.100) and deploy again.

### How Can I Tell If I'm Impacted?

This affects properties that feed into all releases that use Golang v1.17. If impacted, you will receive Bosh templating errors during deploy.

### What Should I Do About It?

Operators can remove the leading zeros and try deploying again.

### Background

From Golang release notes: The ParseIP and ParseCIDR functions in Golang's net library now reject IPv4 addresses which contain decimal components with leading zeros. These components were always interpreted as decimal, but some operating systems treat them as octal. This mismatch could hypothetically lead to security issues if a Go application was used to validate IP addresses which were then used in their original form with non-Go applications which interpreted components as octal.

### Links

- <https://go.dev/doc/go1.17>

## Gorouter Certificates Require a SAN Extension

### Why Should I Be Concerned About This Change?

Routing-release keeps up-to-date with Golang, and Golang 1.17 requires certs to include a Subject Alternative Name (SAN). (This is an enforcement of a deprecation that was introduced in Golang 1.15). If any certificates for services that terminate TLS connections in Gorouter lack a SAN, clients cannot connect to servers and deployment fails. External systems that the Gorouter connects must also have certificates with a valid SAN, or else requests experience a failed TLS handshake.

### How Can I Tell If I'm Impacted?

For all certs in Ops Manager, copy the cert text to a file and decode it with the following command to see if it contains a SAN:

```
openssl x509 -noout -text -in [FILE]
```

Follow this same process for certs on external services that gorouter connects to. See the Knowledge Base article above for detailed instructions.

### What Should I Do About It?

If any certs do not contain a SAN, you must rotate certs with a newly-generated cert that contains a SAN. See the Ops Manager documentation above.

### Background

Golang's `crypto/x509` library uses certs to verify the server or client hostname. In the past, operators could use the Common Name field to input hostname; as of Golang 1.15, the Common Name field has been deprecated for hostname verification and the Subject Alternative Name must be provided to verify hostname.

### Links

- <https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=297525>
- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-operations-manager/3-0/tanzu-ops-manager/security-pcf-infrastructure-rotate-configurable-certs.html>
- <https://go.dev/doc/go1.15#commonname>
- <https://pkg.go.dev/crypto/x509>

## Gorouter sends all responses with transfer-encoded chunks

### Versions Introduced

| Product    | TAS                            |
|------------|--------------------------------|
| Version(s) | <b>2.11.3</b><br><b>2.13.0</b> |

### Why Should I Be Concerned About This Change?

If your clients or proxies that access apps cannot handle a chunked response, or expect a Content-Length header, they will break.

### How Can I Tell If I'm Impacted?

One common symptom is that applications now return duplicate Transfer-Encoding headers, and gorouter logs error "too many transfer encodings".

### What Should I Do About It?

Fix your clients to be able to handle a chunked response.

### Background

Previous versions of TAS may, for short responses, silently remove the Transfer encoding header and replace it with a Content Length header. This convenience was dependent on Golang 1.15 and lead to a false sense of mitigation.

Golang 1.16 now prioritizes flushing partial requests to the client and no longer changes the response to not be chunked.

## Links

- <https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=298288>
- <https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=298108>

## Breaking changes if you are starting from TAS for VMs v2.11

### Log Cache aggregate drain metadata missing

#### Why Should I Be Concerned About This Change?

TAS 2.11.16 moved aggregate drain configuration to the syslog binding cache to improve deploy speed. Dependent on your configuration this could cause the Smoke Test errand to fail.

#### How Can I Tell If I'm Impacted?

You are impacted if “Enable Log Cache syslog ingestion” is checked and “Default loggregator drain metadata” is unchecked and you attempt to upgrade to a version of TAS from 2.11.16 - 2.11.21.

The corresponding product properties are

- .properties.enable\_log\_cache\_syslog\_ingestion
- .properties.default\_loggregator\_drain\_metadata

#### What Should I Do About It?

Upgrade to TAS 2.11.22 or greater.

## Background

Operators may configure aggregate drains to send all application logs to a syslog destination. The same mechanism may be used within TAS to populate Log Cache. If metadata is not enabled for the Log Cache aggregate drain then Log Cache will not have the metadata expected to function correctly.

## Links

- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#2-11-16>
- <https://techdocs.broadcom.com/us/en/vmware-tanzu/platform/tanzu-platform-for-cloud-foundry/4-0/tpcf/runtime-rn.html#2-11-22>

## Minimize user downtime when upgrading from 2.11 to 2.12

## Why Should I Be Concerned About This Change?

To minimize downtime for developers pushing apps, upgrade from TAS for VMs v2.11.9 or later. Upgrading from earlier patch versions can result in an Unknown Error when pushing apps.

## How Can I Tell If I'm Impacted?

Your current version of TAS is 2.11.0 through 2.11.8.

## What Should I Do About It?

You should upgrade to TAS 2.11.9 or higher before upgrading to 2.12 or higher.

## Background

Cloud Controller in affected versions has chance that app lifecycle\_type could be nil when determining app lifecycle.

## Envoy advertises HTTP2 support over ALPN

### Why Should I Be Concerned About This Change?

If applications do not support HTTP/2 when using Container to Container (C2C) communication through the Envoy proxy (ports 61001 or 61443), requests between these apps will fail.

### How Can I Tell If I'm Impacted?

If you are using container to container networking, and have network policies allowing apps to talk to other apps on ports 61001 or 61443, you may be affected.

Use the cf network-policies command to list policies, and look for those ports.

### What Should I Do About It?

Investigate the destination applications for these policies, to determine if they support HTTP/2 requests. If not, the client applications will need to be updated to negotiate down to HTTP/1.1 when making their requests.

## Background

- ALPN is the Application-Layer Protocol Negotiation, which allows HTTP connections to negotiate what protocols are supported.
- Envoy is a proxy sitting alongside each application container to facilitate TLS termination.

## Zipkin Trace-ID Now 16 Bytes

### Versions Introduced

| Product    | TAS            |
|------------|----------------|
| Version(s) | <b>2.11.10</b> |
|            | <b>2.12.6</b>  |

### Why Should I Be Concerned About This Change?

There is a chance that your apps are not capable of processing the longer 8-byte Trace-ID header. If so, you may receive 400-level errors after gorouter forwards requests to your app.

### How Can I Tell If I'm Impacted?

Foundations that do not enable Zipkin are not affected. To see if zipkin is enabled, look at the Networking tab of the TAS tile in Ops Manager, and see if Enable Zipkin is checked.

If Zipkin is enabled, applications incompatible with this change will throw errors in their application or access logs, related to Zipkin header length.

### What Should I Do About It?

The header size was increased from 8-bytes to 16-bytes in accordance to the W3 standard; you must update your app to be able to handle 16-byte request headers.

### Background

Zipkin is a library that allows users to trace a request through multiple components, with the help of a Trace-ID that is the same for the lifecycle of one request. Having a longer Trace-ID is in compliance with W3 standards and also decreases the chance of generating duplicate IDs.

### Links

- <https://zipkin.io/pages/instrumenting.html>
- <https://www.w3.org/TR/trace-context/#trace-id>
- [https://docs.cloudfoundry.org/adminguide/zipkin\\_tracing.html](https://docs.cloudfoundry.org/adminguide/zipkin_tracing.html)

After these changes are handled, continue reading the next sections.

## VMware Tanzu Application Service for Windows v6.0 Release Notes

These are the release notes for VMware Tanzu Application Service for VMs [Windows] (TAS for VMs [Windows]) v6.0.

Because VMware uses the Percona Distribution for MySQL, expect a time lag between Oracle releasing a MySQL patch and VMware releasing TAS for VMs [Windows] containing that patch.

Before you install the tile, review the [Windows Stemcell Compatibility Matrix](#).



Windows Stemcell v2019.79 has been removed from Broadcom Support because of an incompatibility found in the Windows Updates included and the `winc` component used in the Tanzu Platform for Cloud Foundry Windows. This issue has been fixed in TAS for VMs [Windows] v6.0.11. For details, see [Tanzu Platform for Cloud Foundry on Windows - Nov 2024 Stemcell \(2019.79\) Issue Causing Stuck/Hung BOSH Deployments on Windows Diego Cells](#) in the Broadcom Support KB.

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**Deprecation Notice:** Cloud Foundry Command-Line Interface (cf CLI) v7 is deprecated and will lose support. For how to upgrade to cf CLI v8 see [Upgrading to cf CLI v8](#).

## Releases

### 6.0.18

**Release Date:** 07/22/2025

- Bump diego to version [2.118.0](#)
- Bump envoy-nginx to version [0.46.0](#)
- Bump garden-runc to version [1.73.0](#)
- Bump hwc-offline-buildpack to version [3.1.78](#)
- Bump winc to version [2.39.0](#)
- Bump windowsfs-release to version [2.85.0](#)

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.87 |               |
| count-cores-indicator | 2.0.0   |               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.118.0 | <p>▼ v2.118.0</p> <pre> ## 2.118.0 **Release Date**: June 12, 2025 ## Changes - Bumped to golang 1.24.4 - Bumped to jq 1.8 - Go Dependency bumps - △ Removes the ability to configure logging.format.timestamp. All logging timestamps are now in rfc3339 format for readability. Thanks @kart2bc! - Adds the ability to specify a default timeout when using declarative healthchecks in the event an app does not specify one. ## Bosh Job Spec changes: ```diff diff --git a/jobs/auctioneer/spec b/jobs/auctioneer/spec index 1fac48936..e7445644b 100644 --- a/jobs/auctioneer/spec +++ b/jobs/auctioneer/spec @@ -99,10 +99,6 @@ properties: description: When set, the auctioneer attempts to claim a lock from the Locket API. default: true - logging.format.timestamp: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "unix-epoch" - loggregator.use_v2_api: description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." default: false diff --git a/jobs/bbs/spec b/jobs/bbs/spec index 49ad1d095..e80ffc064 100644 --- a/jobs/bbs/spec +++ b/jobs/bbs/spec @@ -163,10 +163,6 @@ properties: description: Maximum number of files (including sockets) the BBS process may have open. default: 100000 - logging.format.timestamp: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which logged strings will be truncated. If set to 0, turns off truncation." default: 640 diff --git a/jobs/file_server/spec b/jobs/file_server/spec </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> index f530805b3..460201389 100644 --- a/jobs/file_server/spec +++ b/jobs/file_server/spec @@ -60,10 +60,6 @@ properties: tls.key: description: "PEM-encoded tls key" - logging.format.timestamp: - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." - default: "unix-epoch" - loggregator.use_v2_api: description: "Whether component should use the v2 loggregator API when sending data to the metron agent instead of the 'legacy' v1 API." default: false diff --git a/jobs/locket/spec b/jobs/locket/spec index 640651ffb..6c50d6346 100644 --- a/jobs/locket/spec +++ b/jobs/locket/spec @@ -67,10 +67,6 @@ properties: diego.locket.sql.ca_cert: description: "Bundle of CA certificates for the Locket to verify the SQL server SSL certificate when connecting via SSL" - logging.format.timestamp: - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." - default: "unix-epoch" - loggregator.use_v2_api: description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." default: false diff --git a/jobs/rep/spec b/jobs/rep/spec index c7e46eeb5..11d203b4c 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -215,6 +215,9 @@ properties: diego.executor.max_log_lines_per_second: description: "EXPERIMENTAL: Maximum log lines allowed per second per app instance. Default value of 0 will disable rate limiting. Minimum recommended value is 100." default: 0 + diego.executor.declarative_healthcheck_default_timeout: + description: "Default timeout for declarative healthcheck. This value is used when the LRP spec does not specify a timeout. Only used if 'enable_declarative_healthcheck' is set to true." + default: "1s" </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <pre> diego.rep.bbs.api_location: description: "Address of the BBS server" @@ -332,10 +335,6 @@ properties: default: [] example: [ "169.254.0.2:15001" ] -   logging.format.timestamp: -     description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -       default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which log strings will be truncated. If set to 0, turns off truncation." default: 640 diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 3383a8bf4..161bc2821 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -61,10 +61,6 @@ properties: description: "Add more permissive ACLs to directories that are bind mounted into containers. Required for Windows 2016 cells" default: false -   logging.format.timestamp: -     description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -       default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which log strings will be truncated. If set to 0, turns off truncation." default: 640 @@ -207,6 +203,9 @@ properties: diego.executor.max_log_lines_per_second: description: "EXPERIMENTAL: Maximum log lines allowed per second per app instance. Default value of 0 will disable rate limiting. Minimum recommended value is 100." default: 0 + diego.executor.declarative_healthcheck_default_timeout: +   description: "Default timeout for declarative healthcheck. This value is used when the LRP spec does not specify a timeout. Only used if 'enable_declarative_healthcheck' is set to true." +     default: "1s" diego.rep.bbs.api_location: description: "Address of the BBS server" diff --git a/jobs/route_emitter/spec b/jobs/route_emitter/spec index df1b8383c..e35eddfb4 100644 </pre> |  |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> --- a/jobs/route_emitter/spec +++ b/jobs/route_emitter/spec @@ -105,10 +105,6 @@ properties:   description: "Experimental: Enable the route-emitter to emit registrations for internal DNS-based service discovery."   default: false -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   tcp.enabled:   description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API."   default: false   diff --git a/jobs/route_emitter_windows/spec b/jobs/route_emitter_windows/spec   index 9db9e8b69..e5a7ac46d 100644 --- a/jobs/route_emitter_windows/spec +++ b/jobs/route_emitter_windows/spec @@ -91,10 +91,6 @@ properties:   description: "The name of the Diego job referenced by this spec (DO NOT override)"   default: "route_emitter_windows" -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   syslog_daemon_config.address:   description: "Syslog host"   default: ""   diff --git a/jobs/ssh_proxy/spec b/jobs/ssh_proxy/spec   index cd39dbd52..fe63cfa97 100644 --- a/jobs/ssh_proxy/spec +++ b/jobs/ssh_proxy/spec @@ -120,10 +120,6 @@ properties:   description: "Connect directly to container IP instead of to the host IP and external port. Suitable only for deployments in which the gorouters and TCP routers can route directly to the container IP of instances."   default: false -  logging.format.timestamp: -    description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -      default: "unix-epoch" -   loggregator.use_v2_api:   description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." </pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |         | <pre> default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.117.0...v2.118.0">https://github.com/cloudfoundry/diego-release/compare/v2.117.0...v2.118.0</a> ## Resources - [Download release 2.118.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.118.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.118.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| envoy-nginx | 0.46.0  | <p>▼ v0.46.0</p> <pre> ## 0.46.0 **Release Date**: July 11, 2025 ## Go Package Updates * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.45.0...v0.46.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.45.0...v0.46.0</a> ## Resources - [Download release 0.46.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.46.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.46.0</a>).  </pre> <p>▼ v0.45.0</p> <pre> ## 0.45.0 **Release Date**: June 19, 2025 ## Changes - Bumped to go 1.24.4 - Bumped nginx to 1.28.0 from 1.27.3 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.44.0...v0.45.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.44.0...v0.45.0</a> ## Resources - [Download release 0.45.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.45.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.45.0</a>). </pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.73.0  | <p>▼ v1.73.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 1.73.0 **Release Date**: June 11, 2025 ## Changes - Dependency Bumps - Bumped garden to 1.24.4 - Bumped containerd to 2.1.0 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.72.0...v1.73.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.72.0...v1.73.0</a> ## Resources - [Download release 1.73.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.73.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.73.0</a>).</pre></div> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                      |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hwc-offline-buildpack | 3.1.78  | <p>▼ v3.1.78</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.55.zip - hwc_buildpack-cached-windows-v3.1.55.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   73.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   73.0.0  </pre> |
|                       |         | <p>▼ v3.1.77</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.54.zip - hwc_buildpack-cached-windows-v3.1.54.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   68.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   68.0.0  </pre> |
|                       |         | <p>▼ v3.1.76</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.54.zip - hwc_buildpack-cached-windows-v3.1.54.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   68.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   68.0.0  </pre> |
|                       |         | <p>▼ v3.1.75</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.54.zip - hwc_buildpack-cached-windows-v3.1.54.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   68.0.0   windows   ## Default Versions   Name   Version  </pre>                            |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |         | <pre>  ---   ---     hwc   68.0.0  </pre> <p>▼ v3.1.74</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.54.zip - hwc_buildpack-cached-windows-v3.1.54.zip ## Packaged Binaries   Name   Version   CF Stacks     ---   ---   ---     hwc   68.0.0   windows   ## Default Versions   Name   Version     ---   ---     hwc   68.0.0  </pre> |
|                   |         | <p>▼ v3.1.73</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.53.zip - hwc_buildpack-cached-windows-v3.1.53.zip ## Packaged Binaries   Name   Version   CF Stacks     ---   ---   ---     hwc   67.0.0   windows   ## Default Versions   Name   Version     ---   ---     hwc   67.0.0  </pre>                                           |
|                   |         | <p>▼ v3.1.72</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.52.zip - hwc_buildpack-cached-windows-v3.1.52.zip ## Packaged Binaries   Name   Version   CF Stacks     ---   ---   ---     hwc   63.0.0   windows   ## Default Versions   Name   Version     ---   ---     hwc   63.0.0  </pre>                                           |
| loggregator-agent | 8.3.8   |                                                                                                                                                                                                                                                                                                                                                                        |
| otel-collector    | 0.11.4  |                                                                                                                                                                                                                                                                                                                                                                        |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                        |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc      | 2.39.0  | <p>▼ v2.39.0</p> <pre> ## 2.39.0 **Release Date**: June 27, 2025 ## Changes * ⚠️ Breaking Change: remove groot.log_format bosh property. Now it is always set to rfc339 - Author: kart2bc - SHA: f234ca46b68fad2deb07f45053fda07a65b41bee * bumpdependancies ## Bosh Job Spec changes: ```diff diff --git a/jobs/groot/spec b/jobs/groot/spec index a73f967..ec4aac2 100644 --- a/jobs/groot/spec +++ b/jobs/groot/spec @@ -31,10 +31,6 @@ properties: description: "Can be debug, info, error or fatal" default: "info" - groot.log_format: - description: "Can be rfc3339 or epoch" - default: "epoch" - groot.refresh_base_layer: description: "EXPERIMENTAL: Delete size file in order to pull fresh base layer." default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.38.0...v2.39.0">https://github.com/cloudfoundry/winc-release/compare/v2.38.0...v2.39.0</a> ## Resources - [Download release 2.39.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.39.0). </pre> <p>▼ v2.38.0</p> <pre> ## 2.38.0 **Release Date**: June 17, 2025 ## Changes - Bumped to golang 1.24.4 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.37.0...v2.38.0">https://github.com/cloudfoundry/winc-release/compare/v2.37.0...v2.38.0</a> ## Resources - [Download release 2.38.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.38.0). </pre> |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                |         | <p>▼ v2.37.0</p> <pre> ## 2.37.0 **Release Date**: June 16, 2025 ## Changes - Adds support for reading GMSA credentials from credhub via the WINDOWS_GMSA_CREDENTIAL_REF environment variable when launching Windows applications. Thanks @winkingturtle-vmw ! - Dependency Bumps ## Bosh Job Spec changes: ``` diff --git a/jobs/winc/spec b/jobs/winc/spec c index 955fdc5..32c8463 100644 --- a/jobs/winc/spec +++ b/jobs/winc/spec @@ -1,10 +1,23 @@ ``` name: winc -templates: {} +templates: + config.json.erb: config/config.json packages: - nstar - winc -properties: {} +properties: + winc.credhub_endpoint: +   description: "Address for credhub server" +   default: "https://credhub.service.cf.internal:8844" + winc.credhub_ca_certificate: +   description: "Credhub CA Certificate" +   default: "" + winc.uaa_credhub_client_id: +   description: "UAA Credhub Client Id for fetching GMSA Credentials" +   default: "" + winc.uaa_credhub_client_secret: +   description: "UAA Credhub Client Secret for fetching GMSA Credentials" +   default: "" ``` ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.36.0...v2.37.0">https://github.com/cloudfoundry/winc-release/compare/v2.36.0...v2.37.0</a> ## Resources - [Download release 2.37.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.37.0). </pre> |
| windows-syslog | 1.3.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component         | Version | Release Notes |
|-------------------|---------|---------------|
| windows-utilities | 0.20.0  |               |
| windowsfs-release | 2.85.0  |               |

## 6.0.17

**Release Date:** 06/17/2025

- Bump envoy-nginx to version [0.44.0](#)
- Bump garden-runc to version [1.72.0](#)
- Bump hwc-offline-buildpack to version [3.1.71](#)
- Bump windowsfs-release to version [2.84.0](#)

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| windows2019 stemcell  | 2019.85 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| diego                 | 2.117.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| envoy-nginx           | 0.44.0  | <p>▼ v0.44.0</p> <pre>## 0.44.0 **Release Date**: May 16, 2025 ## Changes - Update dependencies ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.43.0...v0.44.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.43.0...v0.44.0</a> ## Resources - [Download release 0.44.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.44.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.44.0</a>).</pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.72.0  | <p>▼ v1.72.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 1.72.0 **Release Date**: May 16, 2025 ## Changes - Update dependencies ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.71.0...v1.72.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.71.0...v1.72.0</a> ## Resources - [Download release 1.72.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.72.0).</pre></div> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                      |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hwc-offline-buildpack | 3.1.71  | <p>▼ v3.1.71</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.51.zip - hwc_buildpack-cached-windows-v3.1.51.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   63.0.0  </pre> |
|                       |         | <p>▼ v3.1.70</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.50.zip - hwc_buildpack-cached-windows-v3.1.50.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   63.0.0  </pre> |
|                       |         | <p>▼ v3.1.69</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.50.zip - hwc_buildpack-cached-windows-v3.1.50.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   63.0.0  </pre> |
|                       |         | <p>▼ v3.1.68</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.50.zip - hwc_buildpack-cached-windows-v3.1.50.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version  </pre>                            |

| <b>Component</b>  | <b>Version</b> | <b>Release Notes</b>          |
|-------------------|----------------|-------------------------------|
|                   |                | ---   ---  <br>  hwc   63.0.0 |
| loggregator-agent | 8.3.8          |                               |
| otel-collector    | 0.11.4         |                               |
| smoke-tests       | 4.10.0         |                               |
| winc              | 2.36.0         |                               |
| windows-syslog    | 1.3.8          |                               |
| windows-utilities | 0.20.0         |                               |
| windowsfs-release | 2.84.0         |                               |

## 6.0.16

**Release Date:** 05/15/2025

- Bump diego to version [2.117.0](#)
- Bump envoy-nginx to version [0.43.0](#)
- Bump garden-runc to version [1.71.0](#)
- Bump hwc-offline-buildpack to version [3.1.67](#)
- Bump loggregator-agent to version [8.3.8](#)
- Bump winc to version [2.36.0](#)
- Bump windowsfs-release to version [2.83.0](#)

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b> |
|-----------------------|----------------|----------------------|
| windows2019 stemcell  | 2019.85        |                      |
| count-cores-indicator | 2.0.0          |                      |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.117.0 | <p>▼ v2.117.0</p> <pre> ## 2.117.0 **Release Date**: May 06, 2025 ## Changes - Upgrade to go 1.24 - New property: `diego.rep.extra_root_fs_directory` (thanks @winkingturtle-vmw!) - Directory for extra desired root fses to be used by rep - New properties: `diego.executor.proxy_healthcheck_interval` and `diego.executor.enable_container_proxy_healthcheck` (thanks @Viktor-Velkov!) - Configuration for envoy proxy healthchecks - `cnbappifecycle` is now a standalone module - Add BBS Advanced Metrics <a href="https://github.com/cloudfoundry/diego-release/pull/996">https://github.com/cloudfoundry/diego-release/pull/996</a> (thanks @n-sandalski and @PlamenDoychev!) ## Bosh Job Spec changes: ``diff diff --git a/jobs/bbs/spec b/jobs/bbs/spec index 9204a8d4c..49ad1d095 100644 --- a/jobs/bbs/spec +++ b/jobs/bbs/spec @@ -147,6 +147,18 @@ properties: description: "Timeout in seconds to receive a response to the keepalive ping. If a response is not received within this time, the lock et client will reconnect to another server." default: 22 + diego.bbs.metrics.advanced_metrics.enabled: +   description: Enables emitting BBS Metrics per specified routes/endpoints in advance d_metrics, useful for debugging issues. May i mpact performances. +   default: false + + diego.bbs.metrics.advanced_metrics.route _config.request_count: +   description: Set the routes for which request_count should be emitted. If empty, no request_count metrics will be emitted. +   default: [] + + diego.bbs.metrics.advanced_metrics.route _config.request_latency: +   description: Set the routes for which request_latency should be emitted. If empty, no request_latency metrics will be emitted. +   default: [] + limits.open_files: description: Maximum number of files (inclu </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ding sockets) the BBS process may have open.       default: 100000       diff --git a/jobs/rep/spec b/jobs/rep/spec       index ecff35fa5..c7e46eeb5 100644       --- a/jobs/rep/spec       +++ b/jobs/rep/spec       @@ -57,6 +57,9 @@ properties:         diego.rep.sidecar_rootfs_path:           description: "absolute_path representing th           e root filesystem used for sidecar processes           (ie. '/var/vcap/packages/cflinuxfs4/rootfs.ta           r'). Must be one of the preloaded_rootfses pa           ths. Leaving the default empty string is ok,           as it will then select the first of the preloa           ded_rootfses"           default: ""         + diego.rep.extra_root_fs_dir:           +   description: "dir to scan for extra ro           ots to be loaded by rep"           +   default: "/var/vcap/store/rootfses"         diego.rep.rootfs_providers:           description: "Array of schemes for which th           e underlying garden can support arbitrary roo           t filesystems"           default:             @@ -138,6 +141,12 @@ properties:               diego.executor.use_schedulable_disk_size:                 description: "Use total space available to                 containers reported by Garden. If false the t                 otal size of image plugin store minus max_cac                 he_size_in_bytes is used."                 default: false               + diego.executor.proxy_healthcheck_interva               l:                 +   description: "Interval that checks env                 oy responsiveness every 30s."                 +   default: "30s"               + diego.executor.enable_container_proxy_he                 althcheck:                 +   description: "When set, enables the li                 veness health check for the envoy proxy in th                 e container."                 +   default: false               diego.executor.garden.address:                 description: "Garden server listening addre                 ss."                 default: /var/vcap/data/garden/garden.sock                 diff --git a/jobs/rep_windows/spec b/jobs/r                 ep_windows/spec                 index d34483c0b..3383a8bf4 100644                 --- a/jobs/rep_windows/spec                 +++ b/jobs/rep_windows/spec                 @@ -48,6 +48,9 @@ properties:                   diego.rep.sidecar_rootfs_path:                     description: "absolute_path representing th                     e root filesystem used for sidecar processes                     (ie. '/tmp/windows2012R2'). Must be one of th </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> e preloaded_rootfses paths. Leaving the defau lt empty string is ok, as it will then select the first of he preloaded_rootfses"     default: ""     + diego.rep.extra_root_fs_dir:     +     description: "dir to scan for extra ro otfs to be loaded by rep"     +     default: "/var/vcap/store/rootfses"     diego.rep.rootfs_providers:         description: "Array of schemes for which th e underlying garden can support arbitrary roo t filesystems"         default: [] @@ -133,6 +136,12 @@ properties:     diego.executor.use_schedulable_disk_size:         description: "Use total space available to containers reported by Garden. If false the t otal size of image plugin store minus max_cac he_size_in_bytes is used."         default: false         + diego.executor.proxy_healthcheck_interva l:             +     description: "Interval that checks env oy responsiveness."             +     default: "30s"             + diego.executor.enable_container_proxy_he althcheck:             +     description: "When set, enables the li veness health check for the envoy proxy in th e container."             +     default: false     diego.executor.garden.address:         description: "Garden server listening addre ss."         default: 127.0.0.1:9241     diff --git a/jobs/vizzini/spec b/jobs/vizzi ni/spec     index 901e5236d..b42ae9d49 100644     --- a/jobs/vizzini/spec     +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@     ---     name: vizzini     packages:     - - golang-1.23-linux     + - golang-1.24-linux     - vizzini     templates:     ```      ## Built with go 1.24.2     **Full Changelog**: <a href="https://github.com/clou dfoundry/diego-release/compare/v2.116.0...v2. 117.0">https://github.com/cloudfoundry/diego-release/compare/v2.116.0...v2. 117.0</a>     ## Resources     - [Download release 2.117.0 from bosh.io](h <a href="https://bosh.io/releases/github.com/cloudfound">https://bosh.io/releases/github.com/cloudfound</a> </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ry/diego-release?version=2.117.0).</p> <p>▼ v2.116.0</p> <pre>## 2.116.0 **Release Date**: March 28, 2025 ## Changes - bump go version ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.115.0...v2.116.0">https://github.com/cloudfoundry/diego-release/compare/v2.115.0...v2.116.0</a> ## Resources - [Download release 2.116.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.116.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.116.0</a>).</pre> <p>▼ v2.115.0</p> <pre>## 2.115.0 **Release Date**: February 24, 2025 ## Changes - Expose configuration option to select rootfs used for container's sidecar processes. This configuration resolves the following issue [983] (<a href="https://github.com/cloudfoundry/diego-release/issues/983">https://github.com/cloudfoundry/diego-release/issues/983</a>) observed on systems running with multiple FS stacks. Thanks to @Ivo1116 , @PlamenDoychev! ## Bosh Job Spec changes: ```diff diff --git a/jobs/rep/spec b/jobs/rep/spec index 012234e12..ecff35fa5 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -54,6 +54,9 @@ properties: default: false diego.rep.preloaded_rootfses: description: "Array of name:absolute_path pairs representing root filesystems preloaded onto the underlying garden" + diego.rep.sidecar_rootfs_path: + description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/var/vcap/packages/cflinuxfs4/rootfs.tar'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses" + default: "" diego.rep.rootfs_providers: description: "Array of schemes for which the underlying garden can support arbitrary root filesystems" default:</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 4a7dfefc6..d34483c0b 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -45,6 +45,9 @@ properties: description: "Array of name:absolute_path pairs representing root filesystems preloaded onto the underlying garden" default: - windows2012R2:/tmp/windows2012R2 + diego.rep.sidecar_rootfs_path: +   description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/tmp/windows2012R2'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses" +   default: "" diego.rep.rootfs_providers: description: "Array of schemes for which the underlying garden can support arbitrary root filesystems" default: [] ``` ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.114.0...v2.115.0">https://github.com/cloudfoundry/diego-release/compare/v2.114.0...v2.115.0</a> ## Resources - [Download release 2.115.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.115.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.115.0</a>).</pre> |

#### ▼ v2.114.0

```

## 2.114.0
**Release Date**: February 18, 2025
## Changes
- Add support to Diego for file-based service bindings - https://github.com/cloudfoundry/diego-release/pull/990 - Thank you @klapkova, @dimitardimitrov13!
## Bosh Job Spec changes:
```diff
diff --git a/jobs/rep/spec b/jobs/rep/spec
index 0737d9d1a..012234e12 100644
--- a/jobs/rep/spec
+++ b/jobs/rep/spec
@@ -22,7 +22,8 @@ templates:
tls.key.erb: config/certs/tls.key
tls_ca.crt.erb: config/certs/tls_ca.crt
indicators.yml.erb: config/indicators.yml
-
+ volume_mounted_files.erb: bin/volume_mounted_files
+
```

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> packages: - pid_utils - rep ``` ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.113.0...v2.114.0">https://github.com/cloudfoundry/diego-release/compare/v2.113.0...v2.114.0</a> ## Resources - [Download release 2.114.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.114.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.114.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|           |         | <p>▼ v2.113.0</p> <pre> ## 2.113.0 **Release Date**: February 03, 2025 ## Changes - ⚠ BREAKING CHANGE: `chacha20-poly1305@openssh.com` has been removed from the default allowed ciphers for ssh-proxy. <a href="https://github.com/cloudfoundry/diego-ssh/pull/62">https://github.com/cloudfoundry/diego-ssh/pull/62</a> Thank you @DimitarSch - Bump dependencies - <a href="https://github.com/cloudfoundry/diego-release/pull/986">https://github.com/cloudfoundry/diego-release/pull/986</a> Keep `filepath-securejoin` at `v0.3.6` until `runc` is compatible with `v0.4.0` (thanks @winkingturtle-vmw) ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.112.0...v2.113.0">https://github.com/cloudfoundry/diego-release/compare/v2.112.0...v2.113.0</a> ## Resources - [Download release 2.113.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.113.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.113.0</a>). </pre> |
|           |         | <p>▼ v2.112.0</p> <pre> ## 2.112.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies. ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.111.0...v2.112.0">https://github.com/cloudfoundry/diego-release/compare/v2.111.0...v2.112.0</a> ## Resources - [Download release 2.112.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.112.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.112.0</a>). </pre> <p>▼ v2.111.0</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## 2.111.0 **Release Date**: December 19, 2024 ## Changes - Bump envoy from 1.32.2 to 1.32.3. [Envoy v1.32.3] (<a href="https://github.com/envoyproxy/envoy/releases/tag/v1.32.3">https://github.com/envoyproxy/envoy/releases/tag/v1.32.3</a>) contains multiple CVE fixes. - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.110.0...v2.111.0">https://github.com/cloudfoundry/diego-release/compare/v2.110.0...v2.111.0</a> ## Resources - [Download release 2.111.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.111.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.111.0</a>). </pre> |
|           |         | <p>▼ v2.110.0</p> <pre> ## 2.110.0 **Release Date**: December 10, 2024 ## Changes - Dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.109.0...v2.110.0">https://github.com/cloudfoundry/diego-release/compare/v2.109.0...v2.110.0</a> ## Resources - [Download release 2.110.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.110.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.110.0</a>). </pre>                                                                                                                                                                                                   |
|           |         | <p>▼ v2.109.0</p> <pre> ## 2.109.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.108.0...v2.109.0">https://github.com/cloudfoundry/diego-release/compare/v2.108.0...v2.109.0</a> ## Resources - [Download release 2.109.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.109.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.109.0</a>). </pre>                                                                                                                                                                                                   |
|           |         | <p>▼ v2.108.0</p> <pre> ## 2.108.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           |         | <ul style="list-style-type: none"> <li>- Bump dependancies</li> <li>## Built with go 1.23.4</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.107.0...v2.108.0">https://github.com/cloudfoundry/diego-release/compare/v2.107.0...v2.108.0</a></li> <li>## Resources</li> <li>- [Download release 2.108.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.108.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.108.0</a>) .</li> </ul> <p>▼ v2.107.0</p> <pre> ## 2.107.0 **Release Date**: November 20, 2024 ## Changes - Bump Go - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.106.0...v2.107.0">https://github.com/cloudfoundry/diego-release/compare/v2.106.0...v2.107.0</a> ## Resources - [Download release 2.107.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.107.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.107.0</a>) . </pre> <p>▼ v2.106.0</p> <pre> ## 2.106.0 **Release Date**: November 12, 2024 ## Changes - Various dependency bumps - Various doc and link fixes - Azure zone logs are now in json format with timestamps: <a href="https://github.com/cloudfoundry/diego-release/pull/958">https://github.com/cloudfoundry/diego-release/pull/958</a> ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.105.0...v2.106.0">https://github.com/cloudfoundry/diego-release/compare/v2.105.0...v2.106.0</a> ## Resources - [Download release 2.106.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.106.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.106.0</a>) . </pre> |  |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx      | 0.43.0         | <p>▼ v0.43.0</p> <pre> ## 0.43.0 **Release Date**: April 25, 2025 ## Changes - Bump dependencies ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.42.0...v0.43.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.42.0...v0.43.0</a> ## Resources - [Download release 0.43.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.43.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.43.0</a>). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| garden-runc      | 1.71.0         | <p>▼ v1.71.0</p> <pre> ## 1.71.0 **Release Date**: May 05, 2025 ## Changes - Fixed an issue with noble stemcells for memory calculation - [Bump iptables to libnftnl-1.2.9] (<a href="https://github.com/cloudfoundry/garden-runc-release/commit/5b59b3dd8d0b8bd25cc34773588e74f7c030b743">https://github.com/cloudfoundry/garden-runc-release/commit/5b59b3dd8d0b8bd25cc34773588e74f7c030b743</a>) - [Bump libtool to debian/2.5.4-4] (<a href="https://github.com/cloudfoundry/garden-runc-release/commit/9d7382c9f3d3dc54a9e5b68fb307058d93acff84">https://github.com/cloudfoundry/garden-runc-release/commit/9d7382c9f3d3dc54a9e5b68fb307058d93acff84</a>) ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.70.0...v1.71.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.70.0...v1.71.0</a> ## Resources - [Download release 1.71.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.71.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.71.0</a>). </pre> |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                               |
|-----------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hwc-offline-buildpack | 3.1.67         | <p>▼ v3.1.67</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.50.zip - hwc_buildpack-cached-windows-v3.1.50.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   63.0.0  </pre> |
|                       |                | <p>▼ v3.1.66</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.49.zip - hwc_buildpack-cached-windows-v3.1.49.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   63.0.0  </pre> |
|                       |                | <p>▼ v3.1.65</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.49.zip - hwc_buildpack-cached-windows-v3.1.49.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version    --- ---    hwc   63.0.0  </pre> |
|                       |                | <p>▼ v3.1.64</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.48.zip - hwc_buildpack-cached-windows-v3.1.48.zip ## Packaged Binaries   Name   Version   CF Stacks    --- --- ---    hwc   63.0.0   windows   ## Default Versions   Name   Version  </pre>                            |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |         | <pre>  -   -     hwc   63.0.0  </pre> <p>▼ v3.1.63</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.47.zip - hwc_buildpack-cached-windows-v3.1.47.zip ## Packaged Binaries   Name   Version   CF Stacks     -   -   -   hwc   63.0.0   windows   ## Default Versions   Name   Version     -   -   hwc   63.0.0  </pre> <p>▼ v3.1.62</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.47.zip - hwc_buildpack-cached-windows-v3.1.47.zip ## Packaged Binaries   Name   Version   CF Stacks     -   -   -   hwc   63.0.0   windows   ## Default Versions   Name   Version     -   -   hwc   63.0.0  </pre> |
| loggregator-agent | 8.3.8   | <p>▼ v8.3.8</p> <pre>## What's Changed * Bump dependencies * Fix connection keep-alive time for https- batch syslog drains by @nicklas-dohrn in http s://github.com/cloudfoundry/loggregator-agent -release/pull/699 **Full Changelog**: https://github.com/clou dfoundry/loggregator-agent-release/compare/v 8.3.7...v8.3.8</pre>                                                                                                                                                                                                                                                                                                                                  |
| otel-collector    | 0.11.4  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.36.0  | <p>▼ v2.36.0</p> <pre> ## 2.36.0 **Release Date**: May 09, 2025 ## Changes △△△ Due to an ongoing issue with the CI environment, this release did not perform Integrated Windows Authentication testing. There have been no changes upstream that cause concern for this functionality. △△△ - Bump dependencies ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.35.0...v2.36.0">https://github.com/cloudfoundry/winc-release/compare/v2.35.0...v2.36.0</a> ## Resources - [Download release 2.36.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.36.0). </pre> |
| windows-syslog    | 1.3.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| windowsfs-release | 2.83.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## 6.0.15

**Release Date:** 04/15/2025

- **[Feature]** There is a new “Enable container network traffic metrics for app instances” property in the “Networking” tab
- Bump envoy-nginx to version [0.42.0](#)
- Bump hwc-offline-buildpack to version [3.1.61](#)
- Bump loggregator-agent to version [8.3.7](#)
- Bump otel-collector to version [0.11.4](#)
- Bump winc to version [2.35.0](#)
- Bump windows-syslog to version [1.3.8](#)
- Bump windowsfs-release to version [2.82.0](#)

### Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs [Windows] component since the previous patch version of TAS for VMs [Windows]:

| Component         | Vulnerabilities Resolved                                                                                                                                                                                                                            |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx       | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-qxp5-gwg8-xv66</a> (medium)</li> </ul>                                                                                                                                                    |
| loggregator-agent | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>                                                                                                                                                        |
| otel-collector    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul> |
| winc              | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-qxp5-gwg8-xv66</a> (medium)</li> </ul>                                                                                                                                                    |
| windows-syslog    | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-qxp5-gwg8-xv66</a> (medium)</li> </ul>                                                                                                                                                    |

## Component Release Notes

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.84 |               |
| count-cores-indicator | 2.0.0   |               |
| diego                 | 2.105.0 |               |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx      | 0.42.0         | <p>▼ v0.42.0</p> <pre>## 0.42.0 **Release Date**: March 28, 2025 ## Changes - Bump to go 1.24 ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.41.0...v0.42.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.41.0...v0.42.0</a> ## Resources - [Download release 0.42.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.42.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.42.0</a>).</pre> <p>▼ v0.41.0</p> <pre>## 0.41.0 **Release Date**: March 25, 2025 ## Changes - bump dependencies ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.40.0...v0.41.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.40.0...v0.41.0</a> ## Resources - [Download release 0.41.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.41.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.41.0</a>).</pre> <p>▼ v0.40.0</p> <pre>## 0.40.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.39.0...v0.40.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.39.0...v0.40.0</a> ## Resources - [Download release 0.40.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.40.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.40.0</a>).</pre> |
| garden-runc      | 1.70.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                           |
|-----------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hwc-offline-buildpack | 3.1.61  | <p>▼ v3.1.61</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.46.zip - hwc_buildpack-cached-windows-v3.1.46.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   hwc   59.0.0   windows   ## Default Versions   Name   Version    - -    hwc   59.0.0  </pre> |
|                       |         | <p>▼ v3.1.60</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.45.zip - hwc_buildpack-cached-windows-v3.1.45.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   hwc   59.0.0   windows   ## Default Versions   Name   Version    - -    hwc   59.0.0  </pre> |
|                       |         | <p>▼ v3.1.59</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.45.zip - hwc_buildpack-cached-windows-v3.1.45.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   hwc   59.0.0   windows   ## Default Versions   Name   Version    - -    hwc   59.0.0  </pre> |
|                       |         | <p>▼ v3.1.58</p> <pre>Buildpacks provided by this bosh release: - hwc_buildpack-cached-v3.1.44.zip - hwc_buildpack-cached-windows-v3.1.44.zip ## Packaged Binaries   Name   Version   CF Stacks    - - -   hwc   59.0.0   windows   ## Default Versions   Name   Version  </pre>                        |

| <b>Component</b>  | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                | <pre>  -   -     hwc   59.0.0  </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| loggregator-agent | 8.3.7          | <p>▼ v8.3.7</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.6...v8.3.7">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.6...v8.3.7</a></pre> <p>▼ v8.3.6</p> <pre>## What's Changed * Bump packaged Go to go1.23.7 * Bump dependencies * Fix deadlock in https-batch syslog drains by @nicklas-dohrn in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/648">https://github.com/cloudfoundry/loggregator-agent-release/pull/648</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.5...v8.3.6">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.5...v8.3.6</a></pre> |
| otel-collector    | 0.11.4         | <p>▼ v0.11.4</p> <pre>## What's Changed * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.3...v0.11.4">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.3...v0.11.4</a></pre> <p>▼ v0.11.3</p> <pre>## What's Changed * Bump packaged Golang to go1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.2...v0.11.3">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.2...v0.11.3</a></pre>                                                                                                                                                                                                                                                            |
| smoke-tests       | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.35.0  | <p>▼ v2.35.0</p> <pre> ## 2.35.0 **Release Date**: April 07, 2025 ## Changes △△△ Due to an ongoing issue with the CI environment, this release did not perform Integrated Windows Authentication testing. We're currently working on a fix, and decided to release without IWA testing because it's been over two months since the last release.  There have been no changes upstream that cause concern for this functionality. △△△ - Bump dependencies - Upgrade go to 1.24 ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.34.0...v2.35.0">https://github.com/cloudfoundry/winc-release/compare/v2.34.0...v2.35.0</a> ## Resources - [Download release 2.35.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.35.0). </pre> |
| windows-syslog    | 1.3.8   | <p>▼ v1.3.8</p> <pre> ## What's Changed * Bump blackbox dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.7...v1.3.8">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.7...v1.3.8</a> </pre> <p>▼ v1.3.7</p> <pre> ## What's Changed * Bump blackbox dependencies * Bump packaged Golang to go1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.6...v1.3.7">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.6...v1.3.7</a> </pre>                                                                                                                                                                                                     |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| windowsfs-release | 2.82.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 6.0.14

**Release Date:** 03/25/2025

- Bump windowsfs-release to version 2.80.0

## Security Fixes

No CVEs were fixed in each TAS for VMs [Windows] component since the previous patch version of TAS for VMs [Windows].

## Component Release Notes

| Component             | Version |
|-----------------------|---------|
| windows2019 stemcell  | 2019.83 |
| count-cores-indicator | 2.0.0   |
| diego                 | 2.105.0 |
| envoy-nginx           | 0.39.0  |
| garden-runc           | 1.70.0  |
| hwc-offline-buildpack | 3.1.56  |
| loggregator-agent     | 8.3.5   |
| otel-collector        | 0.11.2  |
| smoke-tests           | 4.10.0  |
| winc                  | 2.34.0  |
| windows-syslog        | 1.3.6   |
| windows-utilities     | 0.20.0  |
| windowsfs-release     | 2.80.0  |

## 6.0.13

**Release Date:** 03/11/2025

- **[Feature Improvement]** Operators can now let Puma auto-configure the number of workers based on the number of available cores.
- **[Feature Improvement]:** Backport GA OpenTelemetry Collector
- Bump envoy-nginx to version 0.39.0
- Bump garden-runc to version 1.70.0
- Bump hwc-offline-buildpack to version 3.1.56
- Bump loggregator-agent to version 8.3.5
- Bump windows-syslog to version 1.3.6
- Bump windowsfs-release to version 2.79.0

## Security Fixes

The following table lists CVEs that were fixed in each TAS for VMs [Windows] component since the previous patch version of TAS for VMs [Windows]:

| <b>Component</b>  | <b>Vulnerabilities Resolved</b>                                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2025-22866</a></li> </ul> |
| garden-runc       | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> </ul>                                                                                     |
| envoy-nginx       | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-w32m-9786-jp63</a></li> </ul>                                                                                |

### Component Release Notes

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b> |
|-----------------------|----------------|----------------------|
| windows2019 stemcell  | 2019.83        |                      |
| count-cores-indicator | 2.0.0          |                      |
| diego                 | 2.105.0        |                      |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx | 0.39.0  | <p>▼ v0.39.0</p> <pre>## 0.39.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.38.0...v0.39.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.38.0...v0.39.0</a> ## Resources - [Download release 0.39.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.39.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.39.0</a>).</pre> |
|             |         | <p>▼ v0.38.0</p> <pre>## 0.38.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.37.0...v0.38.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.37.0...v0.38.0</a> ## Resources - [Download release 0.38.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.38.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.38.0</a>).</pre> |
|             |         | <p>▼ v0.37.0</p> <pre>## 0.37.0 **Release Date**: February 03, 2025 ## Changes - bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.36.0...v0.37.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.36.0...v0.37.0</a> ## Resources - [Download release 0.37.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.37.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.37.0</a>).</pre> |
|             |         | <p>▼ v0.36.0</p> <pre>## 0.36.0 **Release Date**: January 22, 2025 ## Changes</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>- Bump dependancies ##     Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.35.0...v0.36.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.35.0...v0.36.0</a>. ## Resources - [Download release 0.36.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.36.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.36.0</a>).  ▼ v0.35.0  ## 0.35.0 **Release Date**: January 21, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ##     Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.34.0...v0.35.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.34.0...v0.35.0</a>. ## Resources - [Download release 0.35.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.35.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.35.0</a>).</pre> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc           | 1.70.0  | <p>▼ v1.70.0</p> <pre>## 1.70.0 **Release Date**: February 05, 2025 ## Changes - Upgrade containerd to V2 (<a href="https://github.com/cloudfoundry/garden-runc-release/pull/368">https://github.com/cloudfoundry/garden-runc-release/pull/368</a>, <a href="https://github.com/cloudfoundry/guardian/pull/466">https://github.com/cloudfoundry/guardian/pull/466</a>, <a href="https://github.com/cloudfoundry/wga-platform-runtime-ci/pull/61">https://github.com/cloudfoundry/wga-platform-runtime-ci/pull/61</a>) - Various dependency bumps ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.69.0...v1.70.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.69.0...v1.70.0</a> ## Resources - [Download release 1.70.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.70.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.70.0</a>).</pre> <p>▼ v1.69.0</p> <pre>## 1.69.0 **Release Date**: February 03, 2025 ## Changes - bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.68.0...v1.69.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.68.0...v1.69.0</a> ## Resources - [Download release 1.69.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.69.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.69.0</a>).</pre> <p>▼ v1.68.0</p> <pre>## 1.68.0 **Release Date**: January 22, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.67.0...v1.68.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.67.0...v1.68.0</a> ## Resources - [Download release 1.68.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.68.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.68.0</a>).</pre> |
| hwc-offline-buildpack | 3.1.56  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.3.5   | <p>▼ v8.3.5</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 **Full Changelog**: <a href="https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.4...v8.3.5">https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.4...v8.3.5</a></pre> <p>▼ v8.3.4</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.3...v8.3.4">https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.3...v8.3.4</a></pre> |
| otel-collector    | 0.11.2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| winc              | 2.34.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| windows-syslog    | 1.3.6   | <p>▼ v1.3.6</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/clo dfoundry/windows-syslog-release/compare/v1.3.5...v1.3.6">https://github.com/clo dfoundry/windows-syslog-release/compare/v1.3.5...v1.3.6</a></pre>                                                                                                                                                                                                                                                                                                                 |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| windowsfs-release | 2.79.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 6.0.12

**Release Date:** 02/03/2025

- **[Feature Improvement]** Add optional, experimental pprof extension to OTel Collector
- Bump envoy-nginx to version [0.34.0](#)
- Bump garden-runc to version [1.67.0](#)
- Bump hwc-offline-buildpack to version [3.1.52](#)
- Bump loggregator-agent to version [8.3.3](#)
- Bump otel-collector to version [0.11.2](#)

- Bump winc to version [2.34.0](#)
- Bump windows-syslog to version [1.3.5](#)
- Bump windowsfs-release to version [2.77.0](#)

## Security Fixes

The following table lists CVEs that were fixed in each VMware Tanzu Application Service for VMs [Windows] component since the previous patch version of VMware Tanzu Application Service for VMs [Windows]:

| Component         | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-w32m-9786-jp63</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| otel-collector    | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> <li>• <a href="#">CVE-2024-21538</a></li> <li>• <a href="#">CVE-2024-43788</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">CVE-2022-25858</a></li> <li>• <a href="#">GHSA-mh55-gqvf-xfwm</a></li> <li>• <a href="#">CVE-2022-29526</a></li> <li>• <a href="#">CVE-2023-28154</a></li> <li>• <a href="#">GHSA-xr7q-jx4m-x55m</a></li> </ul> |
| loggregator-agent | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                     |
| windows-syslog    | <ul style="list-style-type: none"> <li>• <a href="#">GHSA-w32m-9786-jp63</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| garden-runc       | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Component Release Notes

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.81 |               |
| count-cores-indicator | 2.0.0   |               |
| diego                 | 2.105.0 |               |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx | 0.34.0  | <p>▼ v0.34.0</p> <div style="border: 1px solid black; padding: 10px;"><pre>## 0.34.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.33.0...v0.34.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.33.0...v0.34.0</a> ## Resources - [Download release 0.34.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.34.0).</pre></div> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc           | 1.67.0  | <p>▼ v1.67.0</p> <pre>## 1.67.0 **Release Date**: January 17, 2025 ## Changes - Add support for cgroups v2 <a href="https://github.com/cloudfoundry/guardian/pull/465">https://github.com/cloudfoundry/guardian/pull/465</a> ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.66.0...v1.67.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.66.0...v1.67.0</a> ## Resources - [Download release 1.67.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.67.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.67.0</a>).</pre> <p>▼ v1.66.0</p> <pre>## 1.66.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.65.0...v1.66.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.65.0...v1.66.0</a> ## Resources - [Download release 1.66.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.66.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.66.0</a>).</pre> <p>▼ v1.65.0</p> <pre>## 1.65.0 **Release Date**: December 20, 2024 ## Changes - Fix path for functions #367 - Various dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.64.0...v1.65.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.64.0...v1.65.0</a> ## Resources - [Download release 1.65.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.65.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.65.0</a>).</pre> |
| hwc-offline-buildpack | 3.1.52  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.3.3   | <p>▼ v8.3.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.2...v8.3.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.2...v8.3.3</a></pre></div> |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| otel-collector | 0.11.2  | <p>▼ v0.11.2</p> <pre>## What's Changed * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.1...v0.11.2">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.1...v0.11.2</a></pre> <p>▼ v0.11.1</p> <pre>## What's Changed * Correctly interpolate `secret` properties when the `name` includes a hyphen by @acostal1 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/58">https://github.com/cloudfoundry/otel-collector-release/pull/58</a> * Load string values in `allow_list` properties by @ctlong in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/59">https://github.com/cloudfoundry/otel-collector-release/pull/59</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.1</a></pre> <p>▼ v0.11.0</p> <pre>## What's Changed * Bump packaged Golang to go1.22.8 * Bump OTel Collector components to v0.111.0 by @mkocher in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/56">https://github.com/cloudfoundry/otel-collector-release/pull/56</a> * `otlp` exporter now has batching built in * Internal metrics are now emitted with names prefixed with `otelcol_` * Change `allow_list` properties by @acosta11 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/57">https://github.com/cloudfoundry/otel-collector-release/pull/57</a> * Unspecified or `nil` still equates to "allow all" * An empty array now equates to "allow nothing" instead of "allow all" * Add `pprof` extension by @acosta11 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/57">https://github.com/cloudfoundry/otel-collector-release/pull/57</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.0</a></pre> |
| smoke-tests    | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.34.0  | <p>▼ v2.34.0</p> <pre>## 2.34.0 **Release Date**: January 21, 2025 ## Changes - Bump dependencies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.33.0...v2.34.0">https://github.com/cloudfoundry/winc-release/compare/v2.33.0...v2.34.0</a> ## Resources - [Download release 2.34.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.34.0">https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.34.0</a>).</pre> <p>▼ v2.33.0</p> <pre>## 2.33.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.32.0...v2.33.0">https://github.com/cloudfoundry/winc-release/compare/v2.32.0...v2.33.0</a> ## Resources - [Download release 2.33.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.33.0">https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.33.0</a>).</pre> |
| windows-syslog    | 1.3.5   | <p>▼ v1.3.5</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Golang to gol.1.23.4 ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/windows-syslog-release/pull/77">https://github.com/cloudfoundry/windows-syslog-release/pull/77</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.4...v1.3.5">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.4...v1.3.5</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| windowsfs-release | 2.77.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## 6.0.11

**Release Date:** 01/09/2025

- Bump envoy-nginx to version 0.33.0
- Bump garden-runc to version 1.64.0
- Bump hwc-offline-buildpack to version 3.1.40
- Bump loggregator-agent to version 8.3.2
- Bump winc to version 2.32.0
- Bump windows-syslog to version 1.3.4
- Bump windowsfs-release to version 2.76.0

## Security Fixes

The following table lists CVEs that were fixed in each VMware Tanzu Application Service for VMs [Windows] component since the previous patch version of VMware Tanzu Application Service for VMs [Windows]:

| Component         | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                               |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-44270</a></li><li>• <a href="#">CVE-2024-4068</a></li><li>• <a href="#">CVE-2022-29526</a></li><li>• <a href="#">CVE-2024-21538</a></li><li>• <a href="#">CVE-2024-4067</a></li></ul>                                                                                     |
| loggregator-agent | <ul style="list-style-type: none"><li>• <a href="#">CVE-2023-45288</a></li><li>• <a href="#">CVE-2023-48795</a></li><li>• <a href="#">CVE-2024-43788</a></li><li>• <a href="#">CVE-2023-28154</a></li><li>• <a href="#">CVE-2022-25858</a></li><li>• <a href="#">CVE-2022-29526</a></li><li>• <a href="#">CVE-2024-21538</a></li></ul> |

| Component             | Vulnerabilities Resolved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| hwc-offline-buildpack | <ul style="list-style-type: none"><li>• CVE-2023-45289</li><li>• CVE-2023-45290</li><li>• CVE-2023-45284</li><li>• CVE-2024-24787</li><li>• CVE-2023-45288</li><li>• CVE-2024-24791</li><li>• CVE-2024-34158</li><li>• CVE-2023-24532</li><li>• CVE-2023-29400</li><li>• CVE-2024-24783</li><li>• CVE-2023-24534</li><li>• CVE-2023-24537</li><li>• CVE-2024-24789</li><li>• CVE-2023-24536</li><li>• CVE-2023-29409</li><li>• CVE-2023-24538</li><li>• CVE-2023-24531</li><li>• CVE-2023-24540</li><li>• CVE-2024-24785</li><li>• CVE-2023-39323</li><li>• CVE-2023-29406</li><li>• CVE-2024-34156</li><li>• CVE-2023-39326</li><li>• CVE-2023-29404</li><li>• CVE-2023-29402</li><li>• CVE-2024-34155</li><li>• CVE-2023-45283</li><li>• CVE-2023-24539</li><li>• CVE-2023-29403</li><li>• CVE-2024-24790</li><li>• CVE-2023-39318</li><li>• CVE-2023-29405</li><li>• CVE-2024-24784</li><li>• CVE-2023-39319</li><li>• CVE-2023-44487</li><li>• CVE-2023-39325</li><li>• CVE-2023-45285</li></ul> |

| <b>Component</b> | <b>Vulnerabilities Resolved</b>                                                                                                                                                                                                                                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| windows-syslog   | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2024-43788</a></li> <li>• <a href="#">CVE-2023-28154</a></li> <li>• <a href="#">CVE-2022-25858</a></li> <li>• <a href="#">CVE-2022-29526</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">CVE-2024-21538</a></li> </ul> |
| envoy-nginx      | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-44270</a></li> <li>• <a href="#">CVE-2024-4068</a></li> <li>• <a href="#">CVE-2022-29526</a></li> <li>• <a href="#">CVE-2024-21538</a></li> <li>• <a href="#">CVE-2024-4067</a></li> </ul>                                                                                                                                      |
| garden-runc      | <ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-44270</a></li> <li>• <a href="#">CVE-2024-4068</a></li> <li>• <a href="#">CVE-2022-29526</a></li> <li>• <a href="#">CVE-2024-21538</a></li> <li>• <a href="#">CVE-2024-4067</a></li> </ul>                                                                                                                                      |

## Component Release Notes

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b> |
|-----------------------|----------------|----------------------|
| windows2019 stemcell  | 2019.78        |                      |
| count-cores-indicator | 2.0.0          |                      |
| diego                 | 2.105.0        |                      |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx | 0.33.0  | <p>▼ v0.33.0</p> <pre> ## 0.33.0 **Release Date**: December 05, 2024 ## Changes - [Bump envoy-nginx to release-1.27.3] (https://github.com/cloudfoundry/envoy-nginx-release/commit/d41c8e4538e4d8d30203c4ea9141a24abcd50103) - [Upgrade golang-1.23-windows (1.23.4)] (https://github.com/cloudfoundry/envoy-nginx-release/commit/a680ddca00315e2f2d541bec9e8fd3d2110742e9) - [Update go.mod dependencies] (https://github.com/cloudfoundry/envoy-nginx-release/commit/d17612a386632bacda03d3bd910580d560f49305) - [Update go.mod dependencies] (https://github.com/cloudfoundry/envoy-nginx-release/commit/1d57350325ca5a8d1e3ddc7bdefdefa03f4b399a) ## Built with go 1.23.4 **Full Changelog**: https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.32.0...v0.33.0 ## Resources - [Download release 0.33.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.33.0). </pre> |
|             |         | <p>▼ v0.32.0</p> <pre> ## 0.32.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.31.0...v0.32.0 ## Resources - [Download release 0.32.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.32.0). </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|             |         | <p>▼ v0.31.0</p> <pre> ## 0.31.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.30. </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>0...v0.31.0 ## Resources - [Download release 0.31.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.31.0).  ▼ v0.30.0  ## 0.30.0 **Release Date**: October 24, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.29.  0...v0.30.0 ## Resources - [Download release 0.30.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.30.0).</pre> |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.64.0  | <p>▼ v1.64.0</p> <pre>## 1.64.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.63.0...v1.64.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.63.0...v1.64.0</a> ## Resources - [Download release 1.64.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.64.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.64.0</a>).</pre> |
|             |         | <p>▼ v1.63.0</p> <pre>## 1.63.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.62.0...v1.63.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.62.0...v1.63.0</a> ## Resources - [Download release 1.63.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.63.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.63.0</a>).</pre>                      |
|             |         | <p>▼ v1.62.0</p> <pre>## 1.62.0 **Release Date**: November 18, 2024 ## Changes - Bump golang ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.61.0...v1.62.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.61.0...v1.62.0</a> ## Resources - [Download release 1.62.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.62.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.62.0</a>).</pre>                           |
|             |         | <p>▼ v1.61.0</p> <pre>## 1.61.0 **Release Date**: November 14, 2024 ## Changes - Bump iptables to 1.8.11 ## Built with go 1.23.2</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.60.0...v1.61.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.60.0...v1.61.0</a></p> <ul style="list-style-type: none"> <li># # Resources <ul style="list-style-type: none"> <li>- [Download release 1.61.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.61.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.61.0</a>).</li> </ul> </li> </ul>                                                                                                                                                                        |
|           |         | <p>▼ v1.60.0</p> <p>## 1.60.0<br/> <b>Release Date</b>: November 07, 2024<br/> # # Changes <ul style="list-style-type: none"> <li>- G115 fixes</li> <li>- Pin runc to 1.1.14</li> </ul> # # Built with go 1.23.2<br/> **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.59.0...v1.60.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.59.0...v1.60.0</a></p> <p>## Resources <ul style="list-style-type: none"> <li>- [Download release 1.60.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.60.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.60.0</a>).</li> </ul> </p> |
|           |         | <p>▼ v1.59.0</p> <p>## 1.59.0<br/> <b>Release Date</b>: October 30, 2024<br/> # # Changes <ul style="list-style-type: none"> <li>- Update dependencies</li> </ul> # # Built with go 1.23.2<br/> **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.58.0...v1.59.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.58.0...v1.59.0</a></p> <p>## Resources <ul style="list-style-type: none"> <li>- [Download release 1.59.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.59.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.59.0</a>).</li> </ul> </p>                       |
|           |         | <p>▼ v1.58.0</p> <p>## 1.58.0<br/> <b>Release Date</b>: October 24, 2024<br/> # # Changes <ul style="list-style-type: none"> <li>- Bump dependancies</li> </ul> # # Built with go 1.23.2<br/> **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.57.0...v1.58.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.57.0...v1.58.0</a></p> <p>## Resources <ul style="list-style-type: none"> <li>- [Download release 1.58.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.58.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.58.0</a>).</li> </ul> </p>                         |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                | y/garden-runc-release?version=1.58.0).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| hwc-offline-buildpack | 3.1.40         | <p>▼ 3.1.40</p> <pre>* Add hwc 40.0.0, remove hwc 27.0.0 for stack(s) windows   name   version   cf_stacks    - - -    hwc   40.0.0   windows   Default binary versions:   name   version    - -    hwc   40.0.0   * Uncached buildpack SHA256: 032816c71fb291 75c5c877e91346f95676878ee7dfdd31ed4b877494e8d 61a5b</pre>                                                                                                                                                                                                                                                          |
| loggregator-agent     | 8.3.2          | <p>▼ v8.3.2</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.10 **Full Changelog**: <a href="https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.1...v8.3.2">https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.1...v8.3.2</a></pre> <p>▼ v8.3.1</p> <pre>## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.0...v8.3.1">https://github.com/clo dfoundry/loggregator-agent-release/compare/v8.3.0...v8.3.1</a></pre> |
| otel-collector        | 0.10.1         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| smoke-tests           | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc      | 2.32.0  | <p>▼ v2.32.0</p> <pre>## 2.32.0 **Release Date**: December 18, 2024 ## Changes - Fix an issue where Windows Updates (November 12, 2024 and beyond) broke Windowsfs + Groot on Windows Stemcell 2019.79 #43 - Bump 7zip ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.31.0...v2.32.0">https://github.com/cloudfoundry/winc-release/compare/v2.31.0...v2.32.0</a> ## Resources - [Download release 2.32.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.32.0">https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.32.0</a>).</pre> <p>▼ v2.31.0</p> <pre>## 2.31.0 ⚠️ **KNOWN ISSUE:** When this (or previous) versions of winc-release are used in conjunction with the 2019.79 Windows Stemcell, BOSH Deployes will hang indefinitely on groot's pre-start script while attempting to unpack the Windows FS OCI image. Please stay at stemcell version 2019.78 until this is resolved ⚠️  Update: This issue has been fixed in TAS for VMs [Windows] v6.0.11. **Release Date**: November 14, 2024 ## Changes - Dependency bumps - Updated groot-windows tests for new test image size ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.30.0...v2.31.0">https://github.com/cloudfoundry/winc-release/compare/v2.30.0...v2.31.0</a> ## Resources - [Download release 2.31.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.31.0">https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.31.0</a>).</pre> <p>▼ v2.30.0</p> <pre>## 2.30.0 **Release Date**: November 12, 2024 ## Changes - Bumped to golang 1.23.2 ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.29.0...v2.30.0">https://github.com/cloudfoundry/winc-release/compare/v2.29.0...v2.30.0</a></pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                       |
|-------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |         | <pre>0.0 ## Resources - [Download release 2.30.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.30.0).</pre>                                                                                                                                                 |
| windows-syslog    | 1.3.4   | <p>▼ v1.3.4</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.3...v1.3.4">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.3...v1.3.4</a></pre> |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                     |
| windowsfs-release | 2.76.0  |                                                                                                                                                                                                                                                                                                     |

## 6.0.10

**Release Date:** 11/19/2024

- Bump loggregator-agent to version 8.3.0
- Bump windowsfs-release to version 2.73.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.77 |               |
| count-cores-indicator | 2.0.0   |               |
| diego                 | 2.105.0 |               |
| envoy-nginx           | 0.29.0  |               |
| garden-runc           | 1.57.0  |               |
| hwc-offline-buildpack | 3.1.39  |               |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.3.0   | <p>▼ v8.3.0</p> <pre> ## What's Changed * Add `https-batch` protocol to loggr-syslog-agent for more efficient (batched) https drains by @nicklas-dohrn in https://github.com/cloudfoundry/loggregator-agent-release/pull/491 * Bump dependencies * Bump packaged Golang to go1.22.8 ## New Contributors * @nicklas-dohrn made their first contribution in https://github.com/cloudfoundry/loggregator-agent-release/pull/491 **Full Changelog**: https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.1...v8.3.0 </pre> |
| otel-collector    | 0.10.1  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| winc              | 2.29.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| windows-syslog    | 1.3.3   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| windowsfs-release | 2.73.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## 6.0.9

**Release Date:** 10/07/2024

- Bump diego to version [2.105.0](#)
- Bump envoy-nginx to version [0.29.0](#)
- Bump garden-runc to version [1.57.0](#)
- Bump hwc-offline-buildpack to version [3.1.39](#)
- Bump winc to version [2.29.0](#)
- Bump windowsfs-release to version [2.72.0](#)

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.77 |               |
| count-cores-indicator | 2.0.0   |               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.105.0 | <p>▼ v2.105.0</p> <pre> ## 2.105.0 **Release Date**: October 01, 2024 ## Changes - Upgrade to Go 1.23! - [add healthcheck metrics property] (https://github.com/cloudfoundry/diego-release/commit/fe3aae75d48e6340b526e1d5d327732cd7bf1a8c) - [add healthcheck property to rep_windows config template] (https://github.com/cloudfoundry/diego-release/commit/7dce01426b119d53d0b8923e2681884bb5a4cab7) - [add missing default params for linters] (https://github.com/cloudfoundry/diego-release/commit/e9ccee2dd2bf78c83b15d27c711669c67261d103) - [add metadata to docs and reorder them] (https://github.com/cloudfoundry/diego-release/commit/af178fa335254d47a8fd507822003c60bad4ba59) - Various dependency bumps ## Bosh Job Spec changes: ``diff diff --git a/jobs/rep/spec b/jobs/rep/spec index 405f90f46..0737d9d1a 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -235,7 +235,9 @@ properties: enable_declarative_healthcheck: description: "When set, enables the rep to prefer the LRP CheckDefinition to healthcheck instances over the Monitor action. Requires Garden-Runc v1.10.0+" default: false - + enable_healthcheck_metrics: +   description: "When set, enables the rep to emit healthcheck failure metrics. Requires enable_declarative_healthcheck to be set to true." +   default: false cell Registrations.locket.enabled: description: Enable the cell rep to register itself as a service with Locket. default: true diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 0521d1061..4a7dfefc6 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -237,13 +237,16 @@ properties: diego.rep.locket.client_keepalive_timeout: description: "Timeout in seconds to receive a response to the keepalive ping. If a response is not received within this time, the locket client will reconnect to another server." </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> default: 22 - + enable_declarative_healthcheck: description: "When set, enables the rep to prefer the LRP CheckDefinition to healthcheck instances over the Monitor action." default: false declarative_healthcheck_path: description: "The directory containing the declarative healthcheck binary" default: "/var/vcap/packages/healthcheck_windows/external" +   enable_healthcheck_metrics: +     description: "When set, enables the rep to emit healthcheck failure metrics. Requires enable_declarative_healthcheck to be set to true." +       default: false cell_registrations.locket.enabled: description: Enable the cell rep to register itself as a service with Locket. diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index d61278357..901e5236d 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ --- name: vizzini packages: - - golang-1.22-linux + - golang-1.23-linux - vizzini templates: ``` ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.104.0...v2.105.0">https://github.com/cloudfoundry/diego-release/compare/v2.104.0...v2.105.0</a> ## Resources - [Download release 2.105.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.105.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.105.0</a>).</pre> <p>▼ v2.104.0</p> <pre> ## 2.104.0 **Release Date**: September 24, 2024 ## Changes - Bumped to Envoy to 1.28.7 - [Update file permissions for BBS access log] (<a href="https://github.com/cloudfoundry/bbs/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718">https://github.com/cloudfoundry/bbs/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718</a>) - [Update file permissions for Buildpack App Lifecycle access log] (<a href="https://github.com/cloudfoundry/cl">https://github.com/cloudfoundry/cl</a>)</pre> |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                  |                | <pre> oudfoundry/bbs/compare/9be69c0199dbd4818203b7 382454616d56463e69...4b574f98c713f8e77467ec6a 4ac953ab52ddc718)     - [Update file permissions for cacheddownlo ader] (<a href="https://github.com/cloudfoundry/cachedd">https://github.com/cloudfoundry/cachedd</a> wnloader/compare/09b8631e33d0adb38bbae81529b 63fa3f92d0925...a52cc2a85daa3e138cead7c748881 d24af914c4a)     - [Update file permissions for Executor] (<ht ##="" (<http="" **full="" -="" 0a01dbecc448f78e493c86b0d2672a646f43e9a53...="" 1.22.7="" 180="" 74ea13ef2ca3a6195fed63ce639b2e677ee39...3d1da="" <a="" [update="" a8f0e01a67921c94cfabfc933bb436f1c101faae)="" built="" bumps="" changelog**:="" cloudfoundry="" compa="" compare="" dependency="" executor="" ff34a1d91f50f1615cc6089658f953c7d59)="" file="" for="" github.com="" go="" href="https://github.com/clou dfoundry/diego-release/compare/v2.103.0...v2. 104.0" inigo="" inigo]="" permissions="" re="" s:="" tps:="" various="" with="">https://github.com/cloudfoundry/diego-release/compare/v2.103.0...v2. 104.0     ## Resources     - [Download release 2.104.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.104.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.104.0</a>). </ht></pre> |  |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx      | 0.29.0         | <p>▼ v0.29.0</p> <pre>## 0.29.0 **Release Date**: September 25, 2024 ## Changes - Bumped to Go 1.23 ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.28.0...v0.29.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.28.0...v0.29.0</a> ## Resources - [Download release 0.29.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.29.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.29.0</a>).</pre> <p>▼ v0.28.0</p> <pre>## 0.28.0 **Release Date**: September 24, 2024 ## Changes - Implemented various best practices for file permissions - Various dependency bumps ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.27.0...v0.28.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.27.0...v0.28.0</a> ## Resources - [Download release 0.28.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.28.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.28.0</a>).</pre> |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc           | 1.57.0         | <p>▼ v1.57.0</p> <pre> ## 1.57.0 **Release Date**: October 02, 2024 ## Changes - Upgrade to Go 1.23 - [Create a top-level dir for libtool] (<a href="https://github.com/cloudfoundry/garden-runc-release/commit/fb83c7757f43ec7d4f39b7a9d5fbacbdbd224b11">https://github.com/cloudfoundry/garden-runc-release/commit/fb83c7757f43ec7d4f39b7a9d5fbacbdbd224b11</a>) ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.56.0...v1.57.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.56.0...v1.57.0</a> ## Resources - [Download release 1.57.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.57.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.57.0</a>). </pre> |
| hwc-offline-buildpack | 3.1.39         | <p>▼ 3.1.39</p> <pre> * go.mod: update go version   name   version   cf_stacks    - -    hwc   27.0.0   windows   Default binary versions:   name   version    -    hwc   27.0.0   * Uncached buildpack SHA256: 8326096849f14324075bb0783cefcbe5fb88f2ed77926683995ca8dec336353f </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| loggregator-agent     | 8.2.1          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| otel-collector        | 0.10.1         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| smoke-tests           | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.29.0  | <p>▼ v2.29.0</p> <pre> ## 2.29.0 **Release Date**: September 25, 2024 ## Changes - Bump to Go 1.23.1 - Minor dependency bumps ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.28.0...v2.29.0">https://github.com/cloudfoundry/winc-release/compare/v2.28.0...v2.29.0</a> ## Resources - [Download release 2.29.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.29.0). </pre> |
| windows-syslog    | 1.3.3   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| windowsfs-release | 2.72.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 6.0.8

**Release Date:** 09/27/2024

- **[Bug Fix]** Fixes a bug preventing TCP Routing from working on IST/TASW tiles when the TAS Routing API Endpoint Protocol is configured to be HTTPS only
- Bump diego to version 2.103.0
- Bump envoy-nginx to version 0.27.0
- Bump garden-runc to version 1.56.0
- Bump loggregator-agent to version 8.2.1
- Bump otel-collector to version 0.10.1
- Bump winc to version 2.28.0
- Bump windows-syslog to version 1.3.3
- Bump windowsfs-release to version 2.71.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.77 |               |
| count-cores-indicator | 2.0.0   |               |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego            | 2.103.0        | <p>▼ v2.103.0</p> <pre> ## 2.103.0 **Release Date**: September 12, 2024 ## Changes - Go dependency bumps - Remove toolchain directive for compatibility when building binaries ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.102.0...v2.103.0">https://github.com/cloudfoundry/diego-release/compare/v2.102.0...v2.103.0</a> ## Resources - [Download release 2.103.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.103.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.103.0</a>). </pre> |
| envoy-nginx      | 0.27.0         | <p>▼ v0.27.0</p> <pre> ## 0.27.0 **Release Date**: September 12, 2024 ## Changes - Update dependancies ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.26.0...v0.27.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.26.0...v0.27.0</a> ## Resources - [Download release 0.27.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.27.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.27.0</a>). </pre>                                    |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.56.0  | <p>▼ v1.56.0</p> <pre> ## 1.56.0 **Release Date**: September 11, 2024 ## Changes - Introduces a new `garden.read_header_timeout` property to configure how long garden's HTTP server will wait to read all HTTP request headers. - Bumps to go 1.22.7 - Dependency Bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/garden-windows/spec b/jobs/garden-windows/spec index 004e4e7f..74f545db 100644 --- a/jobs/garden-windows/spec +++ b/jobs/garden-windows/spec @@ -36,6 +36,10 @@ properties: description: "An array of additional arguments which will be passed to the runtime plugin binary" default: [] + garden.read_header_timeout: +   description: "The amount of time allowed to read request headers" +   default: 30s + garden.image_plugin: description: "Path to an image plugin binary" diff --git a/jobs/garden/spec b/jobs/garden/spec index 093e53e1..5a78d357 100644 --- a/jobs/garden/spec +++ b/jobs/garden/spec @@ -128,6 +128,10 @@ properties: description: "Path to a runtime plugin binary" default: /var/vcap/packages/runc/bin/runc + garden.read_header_timeout: +   description: "The amount of time allowed to read request headers" +   default: 30s + garden.no_image_plugin: description: "If true, disables image plugin usage, thus ignoring other image plugin settings" default: false ``` ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.55.0...v1.56.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.55.0...v1.56.0</a> ## Resources - [Download release 1.56.0 from bosh.io](ht </pre> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |         | <p><a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.56.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.56.0</a>.</p> <p>▼ v1.55.0</p> <pre>## 1.55.0 **Release Date**: August 27, 2024 ## Changes - Bump to golang 1.22.6 ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.54.0...v1.55.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.54.0...v1.55.0</a> ## Resources - [Download release 1.55.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.55.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.55.0</a>).</pre> |
| hwc-offline-buildpack | 3.1.38  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.2.1   | <p>▼ v8.2.1</p> <pre>## What's Changed * Fix loggr-forwarder-agent-windows to emit all OTLP signals by default by @ctlong in https://github.com/cloudfoundry/loggregator-agent-release/pull/611 * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.0...v8.2.1">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.0...v8.2.1</a></pre>                                                                                                                                                                                                            |
|                   |         | <p>▼ v8.2.0</p> <pre>## What's Changed * Bump to Golang 1.22.7 * Emit all OTel signals by default by @mkocher in https://github.com/cloudfoundry/loggregator-agent-release/pull/609 * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.7...v8.2.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.7...v8.2.0</a></pre>                                                                                                                                                                                                                        |
|                   |         | <p>▼ v8.1.7</p> <pre>## What's Changed * Bump dependencies * Fix flaky unit tests by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/604 * Ignore linter warnings for G115 by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/607 * Fix uint to int conversion for otelcolclient by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/608 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.6...v8.1.7">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.6...v8.1.7</a></pre> |
|                   |         | <p>▼ v8.1.6</p> <pre>## What's Changed * Δ the `temporary_enable_otel_traces` property has been renamed to `enable_otel_traces`. Since this was prefixed as temporary this release is not a major version bump. * Add support to send LOG and EVENT to Otel Collector as logs by @mkocher in https://github.com/cloudfoundry/loggregator-agent-release/pull/603. For backwards compatibility `enable_otel_metrics` is true by default, and `ena</pre>                                                                                                                                                                                      |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>ble_otel_traces` and `enable_otel_logs` are false by default. * Bump dependencies ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/600">https://github.com/cloudfoundry/loggregator-agent-release/pull/600</a> * @jriguera contributed log support for OTLP forwarding **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.5...v8.1.6">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.5...v8.1.6</a></pre> |

| Component      | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| otel-collector | 0.10.1  | <p>▼ v0.10.1</p> <pre>## What's Changed * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.10.0...v0.10.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.10.0...v0.10.1</a></pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                |         | <p>▼ v0.10.0</p> <pre>## What's Changed * Add 'splunk_hec' exporter, 'filter' processor, and 'transform' processor by @mkocher in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/51">https://github.com/cloudfoundry/otel-collector-release/pull/51</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.9.0...v0.10.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.9.0...v0.10.0</a></pre>                                                                                                                                                                                                                                                                                                                                                       |
|                |         | <p>▼ v0.9.0</p> <pre>## What's Changed * feat: Add CPU limit by @aqstack in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/46">https://github.com/cloudfoundry/otel-collector-release/pull/46</a> * fix: config secret interpolation by @acos tall in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/49">https://github.com/cloudfoundry/otel-collector-release/pull/49</a> ## New Contributors * @acos tall made their first contribution in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/49">https://github.com/cloudfoundry/otel-collector-release/pull/49</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.1...v0.9.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.1...v0.9.0</a></pre> |
|                |         | <p>▼ v0.8.1</p> <pre>## What's Changed * Automatically configure nop pipelines in config when necessary by @iprotsiuk in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/48">https://github.com/cloudfoundry/otel-collector-release/pull/48</a> ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/48">https://github.com/cloudfoundry/otel-collector-release/pull/48</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.0...v0.8.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.0...v0.8.1</a></pre> <p>▼ v0.8.0</p>                                                                                                                                    |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                | <pre> ## What's Changed * add integration tests by @mkocher in https://github.com/cloudfoundry/otel-collector-release/pull/45 * Feat: Add secrets property by @ctlong in https://github.com/cloudfoundry/otel-collector-release/pull/47 **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.7.0...v0.8.0 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| smoke-tests      | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| winc             | 2.28.0         | <p>▼ v2.28.0</p> <pre> ## 2.28.0 **Release Date**: September 17, 2024 ## Changes - Bump golang to 1.22.7 - Dependency bumps ## Built with go 1.22.7 **Full Changelog**: https://github.com/cloudfoundry/winc-release/compare/v2.27.0...v2.28.0 ## Resources - [Download release 2.28.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.28.0). </pre> <p>▼ v2.27.0</p> <pre> ## 2.27.0 **Release Date**: August 28, 2024 ## Changes - Bump golang to 1.22.6 - Dependency bumps ## Built with go 1.22.6 **Full Changelog**: https://github.com/cloudfoundry/winc-release/compare/v2.26.0...v2.27.0 ## Resources - [Download release 2.27.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.27.0). </pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                   |
|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| windows-syslog    | 1.3.3   | <p>▼ v1.3.3</p> <pre>## What's Changed * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.2...v1.3.3">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.2...v1.3.3</a></pre> |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                 |
| windowsfs-release | 2.71.0  |                                                                                                                                                                                                                                                                                 |

## 6.0.7

**Release Date:** 08/22/2024



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade TAS for VMs [Windows]. Failure to upgrade TAS for VMs first will result in TCP route outages on TAS for VMs [Windows].

For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- **[Bug Fix]** Fixes known issue [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#)
- Bump diego to version [2.102.0](#)
- Bump envoy-nginx to version [0.26.0](#)
- Bump garden-runc to version [1.54.0](#)
- Bump loggregator-agent to version [8.1.5](#)
- Bump otel-collector to version [0.7.0](#)
- Bump winc to version [2.26.0](#)
- Bump windows-syslog to version [1.3.2](#)
- Bump windowsfs-release to version [2.68.0](#)

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.76 |               |
| count-cores-indicator | 2.0.0   |               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.102.0 | <p>▼ v2.102.0</p> <pre> ## 2.102.0 **Release Date**: August 09, 2024 ## Changes - Add TLS support for tcp routes in route-emitter   - Split metric_tags from run_info in desired LRP in BBS to minimize database queries issued by convergence   ## Bosh Job Spec changes:   ``diff   diff --git a/jobs/route_emitter/spec b/jobs/route_emitter/spec   index 11dae3aec..df1b8383c 100644   --- a/jobs/route_emitter/spec   +++ b/jobs/route_emitter/spec   @@ -112,6 +112,9 @@  properties:    tcp.enabled:      description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API."      default: false    + tcp.enable_tls:      + description: "When enabled route-emitter will include TLS port and instance GUID when emitting TCP routes."      + default: false    routing_api.url:      description: "Routing API uri to be used by the tcp route-emitter"      default: http://routing-api.service.cf.internal   diff --git a/jobs/route_emitter_windows/spec b/jobs/route_emitter_windows/spec   index cec39c995..9db9e8b69 100644   --- a/jobs/route_emitter_windows/spec   +++ b/jobs/route_emitter_windows/spec   @@ -112,6 +112,9 @@  properties:    tcp.enabled:      description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API."      default: false    + tcp.enable_tls:      + description: "When enabled route-emitter will include TLS port and instance GUID when emitting TCP routes."      + default: false    routing_api.url:      description: "Routing API uri to be used by the tcp route-emitter"      default: http://routing-api.service.cf.internal   ```  ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/clou">https://github.com/clou</a></pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> dfoundry/diego-release/compare/v2.101.0...v2. 102.0 ## Resources - [Download release 2.102.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.102.0).  ▼ v2.101.0  ## 2.101.0 **Release Date**: July 31, 2024 ## Changes - Adds the cnb-app-lifecycle package as a possible app lifecycle for diego. Thanks @pbusk @nicolasbender @modulo11 for this huge effort! - Resolves an issue where CPUWeight could be set to 0 on a container. This value will now always be at least 1, complying with the spec. - Bumped golang to 1.22.5 - Bumped envoy to 1.28.4 - Various testing enhancements ## Bosh Job Spec changes: ```diff diff --git a/jobs/file_server/spec b/jobs/file_server/spec index dddda86c2..f530805b3 100644 --- a/jobs/file_server/spec +++ b/jobs/file_server/spec @@ -20,6 +20,7 @@ packages: - buildpack_app_lifecycle - docker_app_lifecycle - windows_app_lifecycle + - cnb_app_lifecycle provides: - name: file_server ``` ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.100.0...v2.101.0">https://github.com/cloudfoundry/diego-release/compare/v2.100.0...v2.101.0</a> ## Resources - [Download release 2.101.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.101.0). </pre> |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx           | 0.26.0         | <p>▼ v0.26.0</p> <pre> ## 0.26.0 **Release Date**: July 31, 2024 ## Changes - Bumped to Golang 1.22.5 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.25.0...v0.26.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.25.0...v0.26.0</a> ## Resources - [Download release 0.26.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.26.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.26.0</a>). </pre>    |
| garden-runc           | 1.54.0         | <p>▼ v1.54.0</p> <pre> ## 1.54.0 **Release Date**: July 31, 2024 ## Changes - Bump to golang 1.22.5 - Bump libnftnl to 1.2.8 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.53.0...v1.54.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.53.0...v1.54.0</a> ## Resources - [Download release 1.54.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.54.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.54.0</a>). </pre> |
| hwc-offline-buildpack | 3.1.38         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| loggregator-agent     | 8.1.5          | <p>▼ v8.1.5</p> <pre> ## What's Changed * Bump go dependencies </pre> <p>▼ v8.1.4</p> <pre> ## What's Changed * Bump to Go1.22 by @aqstack in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/598">https://github.com/cloudfoundry/loggregator-agent-release/pull/598</a> * Bump go dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.3...v8.1.4">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.3...v8.1.4</a> </pre>                                                                   |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| otel-collector   | 0.7.0          | <p>▼ v0.7.0</p> <pre>## What's Changed * feat: Add memory limits by @aqstack in https://github.com/cloudfoundry/otel-collector-release/pull/43   **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.2...v0.7.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.2...v0.7.0</a></pre> <p>▼ v0.6.2</p> <pre>## What's Changed * Config to allow subset of processors and exporters by @oppegard in https://github.com/cloudfoundry/otel-collector-release/pull/40   **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.1...v0.6.2">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.1...v0.6.2</a></pre> <p>▼ v0.6.1</p> <pre>## What's Changed * Move config.yaml and update scripting by @oppegard in https://github.com/cloudfoundry/otel-collector-release/pull/37   * chore: Bump to Go1.22 by @aqstack in https://github.com/cloudfoundry/otel-collector-release/pull/38     ## New Contributors     * @oppegard made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/37     * @aqstack made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/38       **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.0...v0.6.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.0...v0.6.1</a></pre> |
| smoke-tests      | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.26.0  | <p>▼ v2.26.0</p> <pre> ## 2.26.0 **Release Date**: July 31, 2024 ## Changes - Bump 7zip to 24.07 - Bump golang to 1.22.5 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.25.0...v2.26.0">https://github.com/cloudfoundry/winc-release/compare/v2.25.0...v2.26.0</a> ## Resources - [Download release 2.26.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.26.0). </pre> |
| windows-syslog    | 1.3.2   | <p>▼ v1.3.2</p> <pre> ## What's Changed * Bump packaged Golang to go1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.1...v1.3.2">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.1...v1.3.2</a> </pre>                                                                                                                                                                                            |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| windowsfs-release | 2.68.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## 6.0.6

Release Date: 07/29/2024



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade TAS for VMs [Windows]. Failure to upgrade TAS for VMs first will result in TCP route outages on TAS for VMs [Windows]. For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- **[Bug Fix]** Adds 2 minute caching for failed dns lookups in syslog agent to avoid dns load for malformed drain urls.
- **[Feature]** Adds `PrometheusRemoteWrite` exporter and `batch` processor.
- Bump hwc-offline-buildpack to version `3.1.38`
- Bump loggregator-agent to version `8.1.3`
- Bump otel-collector to version `0.6.0`

- Bump windows-syslog to version 1.3.1

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| windows2019 stemcell  | 2019.75 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| diego                 | 2.100.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| envoy-nginx           | 0.25.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| garden-runc           | 1.53.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| hwc-offline-buildpack | 3.1.38  | <p>▼ 3.1.38</p> <pre> * remove references to the windows2016 stack This stack is identical to the windows stack and windows2016 has been unsupported in CF for a long time now. <a href="https://docs.cloudfoundry.org/devguide/deploy-apps/windows-stacks.html#available-stacks">https://docs.cloudfoundry.org/devguide/deploy-apps/windows-stacks.html#available-stacks</a> * Rebuild buildpack with latest toolchain versions   name   version   cf_stacks     -   -   -   hwc   27.0.0   windows   Default binary versions:   name   version     -   -   hwc   27.0.0   * Uncached buildpack SHA256: 84de52ffbbe99dbc451d3ac9ca2201a356729dc00b11d4956ab2b3318230c3a6 </pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.1.3   | <p>▼ v8.1.3</p> <pre>## What's Changed * Cache failed dns lookups for 120 seconds which reduced load on DNS system when invalid drains are present by @acostall in https://github.com/cloudfoundry/loggregator-agent-release/pull/596 **Full Changelog**: https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.2...v8.1.3</pre> <p>▼ v8.1.2</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.1...v8.1.2</pre>                                                                                                                                                                                                                                                                                                                                                                                                                |
| otel-collector    | 0.6.0   | <p>▼ v0.6.0</p> <pre>## What's Changed * Expose wider collector configuration by @acrmp in https://github.com/cloudfoundry/otel-collector-release/pull/31. This allows for configuring processors, pipelines &amp; exporters which provides a lot more flexibility to platform engineers. * Add PrometheusRemoteWrite Exporter by @benjaminguttmann-avtq in https://github.com/cloudfoundry/otel-collector-release/pull/26 * Add batch processor by @acrmp in https://github.com/cloudfoundry/otel-collector-release/pull/32 * Bump go.opentelemetry.io/collector/cmd/builder from 0.103.0 to 0.104.0 in /src/otel-collector-builder by @dependabot in https://github.com/cloudfoundry/otel-collector-release/pull/30 ## New Contributors * @benjaminguttmann-avtq made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/26 **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.5.0...v0.6.0</pre> |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                        |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.25.0  |                                                                                                                                                                                                                                                                                                      |
| windows-syslog    | 1.3.1   | <p>▼ v1.3.1</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.0...v1.3.1">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.3.0...v1.3.1</a></pre> |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                      |
| windowsfs-release | 2.67.0  |                                                                                                                                                                                                                                                                                                      |

## 6.0.5



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade TAS for VMs [Windows]. Failure to upgrade TAS for VMs first will result in TCP route outages on TAS for VMs [Windows].

For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

**Release Date:** 07/08/2024

- Bump diego to version [2.100.0](#)
- Bump otel-collector to version [0.5.0](#)
- Bump winc to version [2.25.0](#)
- Bump windowsfs-release to version [2.67.0](#)

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.74 |               |
| count-cores-indicator | 2.0.0   |               |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego                 | 2.100.0        | <p>▼ v2.100.0</p> <pre> ## Changes - Bumped loggregator usage to loggregator v 9 - Thanks @Birdrock! - Bumped cfhttp usage to cfhttp v2 - Thanks @jrussett ! - Bumped go dependency bumps ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.99.0...v2.100.0">https://github.com/cloudfoundry/diego-release/compare/v2.99.0...v2.100.0</a> ## Resources - [Download release 2.100.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.100.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.100.0</a>). </pre>                                                                                                                                                                                                       |
| envoy-nginx           | 0.25.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| garden-runc           | 1.53.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| hwc-offline-buildpack | 3.1.36         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| loggregator-agent     | 8.1.1          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| otel-collector        | 0.5.0          | <p>▼ v0.5.0</p> <pre> ## What's Changed * Bump otel-collector to v0.103.0 in http s://github.com/cloudfoundry/otel-collector-re lease/pull/28. * If you have configured exporters to use p ersistent queues note that [re-enqueuing of f ailed batches has been removed] (<a href="https://github.com/open-telemetry/opentelemetry-collector/releases/tag/v0.92.0">https://github.com/open-telemetry/opentelemetry-collector/releases/tag/v0.92.0</a>). * Bump to [go1.21.11] (<a href="https://groups.google.com/g/golang-announce/c/XbxouI9gY7k/m/TuoGEhxIEwAJ">https://groups.google.com/g/golang-announce/c/XbxouI9gY7k/m/TuoGEhxIEwAJ</a>). **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.1...v0.5.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.1...v0.5.0</a> </pre> |
| smoke-tests           | 4.10.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.25.0  | <p>▼ v2.25.0</p> <pre> ## Changes - Bumped golang to 1.22.3 - Bumped many go package dependencies ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.24.0...v2.25.0">https://github.com/cloudfoundry/winc-release/compare/v2.24.0...v2.25.0</a> ## Resources - [Download release 2.25.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.25.0">https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.25.0</a>). </pre> |
| windows-syslog    | 1.3.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| windowsfs-release | 2.67.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 6.0.4

**Release Date:** 05/29/2024

- **[Bug Fix]** Remove replication-canary
- Bump diego to version [2.99.0](#)
- Bump garden-runc to version [1.53.0](#)

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.73 |               |
| count-cores-indicator | 2.0.0   |               |

| <b>Component</b> | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego            | 2.99.0         | <p>▼ v2.99.0</p> <pre> ## Changes - Do not remove evacuating actual LRP during cleanup ([rep#53] (<a ##="" (<a="" ([bbs#95]="" ([buildpackapplifecycle#71]="" ([router-emitter#34]="" )))="" **full="" -="" 1.22.3="" <a="" `1.28.3`="" add="" additional="" all="" and="" apps="" bbs="" blob="" built="" bump="" bumps="" by="" changelog**:="" checking="" credentials.="" credhub="" dependency="" emitter="" envoy="" errors="" explicit="" failure="" for="" go="" href="https://github.com/cloudfoundry/diego-release/compare/v2.98.0...v2.99.0" in="" logic="" make="" mod="" more="" of="" panics="" prevent="" retries="" retry="" router="" start-up="" to="" types="" use="" version="" when="" with="">https://github.com/cloudfoundry/diego-release/compare/v2.98.0...v2.99.0</a> ## Resources - [Download release 2.99.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.99.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.99.0</a>). </pre> |
| envoy-nginx      | 0.25.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component   | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| garden-runc | 1.53.0  | <p>▼ v1.53.0</p> <pre> ## Changes - **DEPRECATION NOTICE** The `garden.experimental_use_containerd_mode_for_processes` property and usage of Garden when run in containerd mode for processes is now deprecated and no longer tested. - **DEFAULT CHANGE** - The default mode for garden containers is now containerd. This has been the default in cf-deployment since 2018. - **REMOVAL OF EXPERIMENTAL FUNCTIONALITY NOTICE** The experimental option to run the garden server process in rootless mode has been removed, as it did not work as expected and was an abandoned feature. - Go package dependency bumps ## Bosh Job Spec changes: ``` diff --git a/jobs/garden-binaries/spec b/jobs/garden-binaries/spec index 0433639a..a8a96bae 100644 --- a/jobs/garden-binaries/spec +++ b/jobs/garden-binaries/spec @@ -15,7 +15,6 @@ packages: - grootfs - xfs-progs - thresholder - - netplugin-shim - dontpanic - tini diff --git a/jobs/garden/spec b/jobs/garden/spec index 027df351..093e53e1 100644 --- a/jobs/garden/spec +++ b/jobs/garden/spec @@ -36,7 +36,6 @@ packages: - grootfs - xfs-progs - thresholder - - netplugin-shim - dontpanic - tini @@ -199,10 +198,6 @@ properties: description: AppArmor profile to use for unprivileged container processes default: garden-default - garden.experimental_rootless_mode: -   description: A boolean stating whether or not to run garden-server as a non-root user -   default: false - # We believe this defaults to false to help concourse: https://github.com/cloudfoundry/garden-runc-release/releases/tag/v1.5.0 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> # For diego/cf, this should be set to true garden.cleanup_process_dirs_on_wait: @@ -210,8 +205,8 @@ properties: default: false garden.containerd_mode: -   description: "Use containerd for container lifecycle management. NOTE: cannot be used in combination with bpm or rootless" -   default: false +   description: "Use containerd for container lifecycle management. NOTE: cannot be used in combination with bpm" +   default: true garden.tcp_keepalive_time: description: Sets the `net.ipv4.tcp_keepalive_time` kernel parameter in containers. If not specified, the value from the linux init_net namespace is used. @@ -229,7 +224,7 @@ properties: description: Sets the `net.ipv4.tcp_retries2` kernel parameter in containers. If not specified, the value from the linux init_net namespace is used. garden.experimental_use_containerd_mode_for_processes: -   description: "(Under development) Use containerd for container process management. Must be used with containerd_mode also set to true. NOTE: cannot be used in combination with bpm or rootless" +   description: "(Deprecated) No longer used/tested." default: false garden.experimental_cpu_throttling: diff --git a/jobs/gats/spec b/jobs/gats/spec c index 916a35eb..065e3ace 100644 --- a/jobs/gats/spec +++ b/jobs/gats/spec @@ -22,12 +22,6 @@ properties: garden_test_rootfs: description: Test rootfs to use default: 'docker:///cloudfoundry/garden-rootfs' -   containerd_for_processes: -   description: Run GATS with CONTAINERD_FOR PROCESSES ENABLED -   default: false -   rootless: -   description: Run GATS with ROOTLESS enabled -   default: false cpu_throttling: description: Run GATS with CPU THROTTLING ENABLED default: false ``` </pre> |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |         | <pre>## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.52.0...v1.53.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.52.0...v1.53.0</a> ## Resources - [Download release 1.53.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.53.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.53.0</a>).</pre> |
| hwc-offline-buildpack | 3.1.36  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| loggregator-agent     | 8.1.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| otel-collector        | 0.4.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| smoke-tests           | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| winc                  | 2.24.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| windows-syslog        | 1.3.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| windows-utilities     | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| windowsfs-release     | 2.66.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## 6.0.3

**Release Date:** 05/03/2024

- Bump loggregator-agent to version 8.1.1
- Bump winc to version 2.24.0

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.72 |               |
| count-cores-indicator | 2.0.0   |               |
| diego                 | 2.98.0  |               |
| envoy-nginx           | 0.25.0  |               |
| garden-runc           | 1.52.0  |               |
| hwc-offline-buildpack | 3.1.36  |               |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.1.1   | <p>▼ v8.1.1</p> <pre> ## What's Changed * Bump dependencies * Fix Syslog Binding Cache polling to wait for the entire polling interval between each operation in https://github.com/cloudfoundry/ loggregator-agent-release/pull/572 **Full Changelog**: https://github.com/cloudfoundry/loggregator-agent-release/compare/v 8.1.0...v8.1.1 </pre>                                                                                                                                                                                                                                                                                                      |
| otel-collector    | 0.4.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| winc              | 2.24.0  | <p>▼ v2.24.0</p> <pre> ## Changes - Bump Golang to 1.22.2 ## Built with go 1.22.2 **Full Changelog**: https://github.com/cloudfoundry/winc-release/compare/v2.23.0...v2.2 4.0 ## Resources - [Download release 2.24.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.24.0). </pre> <p>▼ v2.23.0</p> <pre> ## Changes - Update Golang to 1.21.9 ## Built with go 1.21.9 **Full Changelog**: https://github.com/cloudfoundry/winc-release/compare/v2.22.0...v2.2 3.0 ## Resources - [Download release 2.23.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.23.0). </pre> |
| windows-syslog    | 1.3.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| windowsfs-release | 2.66.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## 6.0.2

**Release Date:** 05/01/2024

- **[Bug Fix]** Windows syslog forwarder handles case when remote syslog endpoints are unavailable by backing off and eventually restarting.
- Bump diego to version 2.98.0
- Bump envoy-nginx to version 0.25.0
- Bump garden-runc to version 1.52.0
- Bump hwc-offline-buildpack to version 3.1.36
- Bump loggregator-agent to version 8.1.0
- Bump windows-syslog to version 1.3.0
- Bump windowsfs-release to version 2.66.0

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| windows2019 stemcell  | 2019.72 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| diego                 | 2.98.0  | <p>▼ v2.98.0</p> <pre> ## Changes - Update Golang to 1.22 ## Bosh Job Spec changes: ``diff diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index 7eb920159..d61278357 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ --- name: vizzini packages: - - golang-1.21-linux + - golang-1.22-linux - vizzini templates: ``` ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.97.0...v2.98.0">https://github.com/cloudfoundry/diego-release/compare/v2.97.0...v2.98.0</a> ## Resources - [Download release 2.98.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.98.0). </pre> |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| envoy-nginx           | 0.25.0         | <p>▼ v0.25.0</p> <pre> ## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.24.0...v0.25.0">https://github.com/cloudfoundry/envoy-nginx-release/compare/v0.24.0...v0.25.0</a> ## Resources - [Download release 0.25.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.25.0">https://bosh.io/releases/github.com/cloudfoundry-incubator/envoy-nginx-release?version=0.25.0</a>). </pre> |
| garden-runc           | 1.52.0         | <p>▼ v1.52.0</p> <pre> ## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.51.0...v1.52.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.51.0...v1.52.0</a> ## Resources - [Download release 1.52.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.52.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.52.0</a>). </pre>                     |
| hwc-offline-buildpack | 3.1.36         | <p>▼ 3.1.36</p> <pre> * Updating github-config * add codeowners (#165)   name   version   cf_stacks    - - -    hwc   27.0.0   windows, windows2016   Default binary versions:   name   version    - -    hwc   27.0.0   * Uncached buildpack SHA256: 30d59d5cff56d1768d1a48146e821ecfd7de75ed3f092590a09aa153a0d79c34 * Uncached buildpack SHA256: 4001012ed375f339109bad48a0b95c819e0ca3e9b0e7b76d52bf339ddd7f2072 </pre>                                                                                                                            |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.1.0   | <p>▼ v8.1.0</p> <pre> ## What's Changed * Replace usages of `grpc.Dial` with `grpc.NewClient` which does not open connections until necessary * Bump dependencies ### Experimental OTel Collector changes * Added `temporary_emit_otel_traces` property to the loggr-forwarder-agent and loggr-forwarder-agent-windows jobs. Setting this property to `true` activates conversion of appropriately tagged http timers to OpenTelemetry traces (it defaults to `false`). See cloudfoundry/gorouter#407. **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.3...v8.1.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.3...v8.1.0</a> </pre> <p>▼ v8.0.4</p> <pre> Don't use. It contains the code changes from v8.1.0 but without a semver minor bump to indicate new functionality. </pre> |
| otel-collector    | 0.4.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| winc              | 2.22.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| windows-syslog    | 1.3.0   | <p>▼ v1.3.0</p> <pre> ## What's Changed * Fix errors stemming from a hanging blackbox client when forwarding syslog messages to an unresponsive server over TCP or TLS in <a href="https://github.com/cloudfoundry/windows-syslog-release/pull/56">https://github.com/cloudfoundry/windows-syslog-release/pull/56</a> * Adds an exponential backoff when attempting to connect to servers * Adds a configurable property to control the maximum number of connection retries (default: 10) before the job fatally exits **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.2.5...v1.3.0">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.2.5...v1.3.0</a> </pre>                                                                                                                                      |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| windowsfs-release | 2.66.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 6.0.1

**Release Date:** 04/17/2024

- Bump diego to version [2.97.0](#)
- Bump loggregator-agent to version [8.0.0.3](#)
- Bump otel-collector to version [0.4.1](#)
- Bump smoke-tests to version [4.10.0](#)
- Bump windows-syslog to version [1.2.5](#)
- Bump windowsfs-release to version [2.65.0](#)

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| windows2019 stemcell  | 2019.72 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| diego                 | 2.97.0  | <p>▼ v2.97.0</p> <pre> ## Changes - Adds support for comma-delimited destinations in ASGs - See: <a href="https://github.com/cloudfoundry/executor/pull/96">https://github.com/cloudfoundry/executor/pull/96</a> and <a href="https://github.com/cloudfoundry/bbs/pull/94">https://github.com/cloudfoundry/bbs/pull/94</a> - Bump bosh package blobs - Bumps `jq` to `1.7.1` - Bumps `tar` - Bump go.mod dependencies ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.96.0...v2.97.0">https://github.com/cloudfoundry/diego-release/compare/v2.96.0...v2.97.0</a> ## Resources - [Download release 2.97.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.97.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.97.0</a>).</pre> |
| envoy-nginx           | 0.24.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| garden-runc           | 1.51.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| hwc-offline-buildpack | 3.1.35  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| loggregator-agent | 8.0.3   | <p>▼ v8.0.3</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.2...v8.0.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.2...v8.0.3</a></pre>         |
| otel-collector    | 0.4.1   | <p>▼ v0.4.1</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.0...v0.4.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.0...v0.4.1</a></pre>               |
| smoke-tests       | 4.10.0  | <p>▼ 4.10.0</p> <pre>Create bosh final release 4.10.0</pre> <p>▼ 4.9.5</p> <pre>Create bosh final release 4.9.5 ## What's Changed * Upgrade Golang to 1.22 by @tas-operability-bot in <a href="https://github.com/pivotal/smoke-tests/pull/138">https://github.com/pivotal/smoke-tests/pull/138</a> **Full Changelog**: <a href="https://github.com/pivotal/smoke-tests/compare/4.9.5...4.9.5">https://github.com/pivotal/smoke-tests/compare/4.9.5...4.9.5</a></pre> |
| winc              | 2.22.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| windows-syslog    | 1.2.5   | <p>▼ v1.2.5</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/windows-syslog-release/compare/v1.2.4...v1.2.5">https://github.com/cloudfoundry/windows-syslog-release/compare/v1.2.4...v1.2.5</a></pre>                                                                                                                                                                   |

| Component         | Version | Release Notes |
|-------------------|---------|---------------|
| windows-utilities | 0.20.0  |               |
| windowsfs-release | 2.65.0  |               |

## 6.0.0

Release Date: 04/09/2024

- **[Breaking Change]** Replace cpu entitlement counters with cpu\_entitlement percentage gauge
- **[Breaking Change]** Remove (deprecated) Metrics Agent and Metrics Discovery Release
- **[Feature]** Add support for NTLM authentication in Gorouter
- **[Feature]** Adds Diego support for Docker workloads using OCI images
- **[Feature]** Expose a custom environment identifier on component logs forwarded via syslog
- **[Feature Improvement]** OTel Collector marks OTLP Sums as monotonic if they originate from a Loggregator counter
- **[Feature Improvement]** Garden now emits an `UnkillableContainers` metric to help identify cells that will be unable to redeploy successfully without operator intervention
- **[Feature Improvement]** Make database “encrypt key” setting more intentional, to avoid password-manager autofilling of the field
- **[Feature Improvement]** Reintroduce global log rate limit
- **[Feature Improvement]** A more useful error is now thrown if the (windows) stemcell has not been configured with the necessary CCG support.

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| windows2019 stemcell  | 2019.71 |               |
| count-cores-indicator | 2.0.0   |               |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego                 | 2.96.0         | <p>▼ v2.96.0</p> <pre> ## Changes - Bump to golang 1.21.8 - Golang package dependency bumps - Includes moving from docker v20 to docker v26 - Includes moving from pgx v3 to pgx v5 - Remove references to Consul from boshrele ase + documentation - Many fixes to remove deprecated code and otherwise fix linter violations.  ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.95.0...v2.96.0">https://github.com/cloudfoundry/diego-release/compare/v2.95.0...v2.96.0</a>  ## Resources - [Download release 2.96.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.96.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.96.0</a>). </pre> |
| envoy-nginx           | 0.24.0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| garden-runc           | 1.51.0         | <p>▼ v1.51.0</p> <pre> ## Changes - Bumped Golang to 1.21.8 - Golang package dependency bumps - Many updates to get codebase passing the staticcheck linker - Updated garden-integration-tests to be a little less flakey  ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.50.0...v1.51.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.50.0...v1.51.0</a>  ## Resources - [Download release 1.51.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.51.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.51.0</a>). </pre>                                                                               |
| hwc-offline-buildpack | 3.1.35         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| loggregator-agent     | 8.0.2          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| otel-collector        | 0.4.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| smoke-tests           | 4.8.5          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| winc              | 2.22.0  | <p>▼ v2.22.0</p> <pre> ## Changes - Many changes to remove usage of deprecated code + fix linting errors - Bump to golang 1.21.8 - Golang package dependency bumps ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/winc-release/compare/v2.21.0...v2.22.0">https://github.com/cloudfoundry/winc-release/compare/v2.21.0...v2.22.0</a>  ## Resources - [Download release 2.22.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/winc-release?version=2.22.0). </pre> |
| windows-syslog    | 1.2.4   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| windows-utilities | 0.20.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| windowsfs-release | 2.64.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## How to Upgrade

The TAS for VMs [Windows] v6.0 tile is available with the release of VMware Tanzu Application Service for VMs (TAS for VMs) v6.0. To use the TAS for VMs [Windows] v6.0 tile, you must install VMware Tanzu Operations Manager v2.10 or later and TAS for VMs v6.0 or later.

## New Features in TAS for VMs [Windows] v6.0

TAS for VMs [Windows] v6.0 includes the following major feature:

### Reintroduction of global log rate limit

TAS v3.0 introduced granular app log rate limits for fine-grained control over application log rates.

TAS for VMs [Windows] v4.0 removed the older global log rate limit feature **App log rate limit (deprecated)** under **App Containers**. This was problematic for operators who were performing a jump upgrade to TAS for VMs [Windows] v4.0 (skipping v3.0), as logs would not be rate limited until application-based log rate limits were applied.

TAS for VMs [Windows] v6.0 restores the global log rate limit, so that operators can perform upgrades while retaining log rate limits. Operators must configure the same setting separately for both VMware Tanzu Application Service for VMs and Isolation Segment.

If you had previously set a global log rate limit, this limit is re-applied following the upgrade to TAS for VMs [Windows] v6.0.

## Breaking changes

TAS for VMs [Windows] v6.0 includes the following breaking changes:

## Known issues

There are no known issues for TAS for VMs [Windows] v6.0.

## Isolation Segment v6.0 Release notes

Here you will find the release notes for Isolation Segment v6.0.

VMware Tanzu Application Service for VMs (TAS for VMs) is certified by the Cloud Foundry Foundation for 2023.

For more information about the Cloud Foundry Certified Provider Program, see [How Do I Become a Certified Provider?](#) on the Cloud Foundry website.

Because VMware uses the Percona Distribution for MySQL, expect a time lag between Oracle releasing a MySQL patch and VMware releasing TAS for VMs containing that patch.

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**Deprecation Notice:** Cloud Foundry Command-Line Interface (cf CLI) v7 is deprecated and will lose support. For how to upgrade to cf CLI v8 see [Upgrading to cf CLI v8](#).



For release 6.0.0 to 6.0.3, CVE-2024-22279. (VMware Tanzu Application Service for VMs GoRouter contains an RFC protocol issue that can lead to a denial of service) has been fixed. For details, see [TNZ-2024-0100](#).

## Releases

### 6.0.18

**Release Date:** 07/22/2025

- **[Bug Fix]** Pick correct rootfs for sidecar containers
- Bump cf-networking to version [3.72.0](#)
- Bump cflinuxfs3 to version [0.642.0](#)
- Bump cflinuxfs4 to version [1.317.0](#)
- Bump diego to version [2.118.0](#)
- Bump garden-runc to version [1.73.0](#)
- Bump nfs-volume to version [7.32.0](#)
- Bump routing to version [0.342.0](#)
- Bump silk to version [3.72.0](#)
- Bump smb-volume to version [3.30.0](#)

### Components

The following table shows the component versions used in this version of Isolation Segment.

| <b>Component</b>          | <b>Version</b> |
|---------------------------|----------------|
| stemcell os: ubuntu-jammy | 1.844          |
| bpm                       | 1.4.20         |
| cf-networking             | 3.72.0         |
| cflinuxfs3                | 0.642.0        |
| cflinuxfs4                | 1.317.0        |
| cf-cli                    | 2.3.0          |
| count-cores-indicator     | 2.0.0          |
| diego                     | 2.118.0        |
| garden-runc               | 1.73.0         |
| loggregator-agent         | 8.3.8          |
| nfs-volume                | 7.32.0         |
| otel-collector            | 0.11.4         |
| routing                   | 0.342.0        |
| silk                      | 3.72.0         |
| smb-volume                | 3.30.0         |
| smoke-tests               | 4.10.0         |
| syslog                    | 12.3.9         |
| tanzu-jammy-stack         | 1.0.1          |

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b> |
|-----------------------|----------------|----------------------|
| ubuntu-jammy stemcell | 1.844          |                      |
| bpm                   | 1.4.20         |                      |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-networking         | 3.72.0  | <p>▼ v3.72.0</p> <pre>## 3.72.0 **Release Date**: June 16, 2025 ## Changes - Dependency Bumps ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.71.0...v3.72.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.71.0...v3.72.0</a> ## Resources - [Download release 3.72.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.72.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.72.0</a>).</pre> <p>▼ v3.71.0</p> <pre>## 3.71.0 **Release Date**: June 11, 2025 ## Changes - Fixes a bug where policy-server's network-policy list API would break when a user had more than 100 roles in CF. This affected both the `cf network-policies` and `cf remove-network-policy` commands. Thanks @mariash! - Modifies policy-server DB migrations to happen inside the `policy-server` main command, instead of as a pre-start, to remove our reliance on a custom fork of the migration library. Thanks @kart2bc ! - Refactored cni-loader to work with non-deprecated config loading functions. Thanks @kart2bc ! - Bumped to golang 1.24.4 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.70.0...v3.71.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.70.0...v3.71.0</a> ## Resources - [Download release 3.71.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.71.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.71.0</a>).</pre> |
| cflinuxfs3            | 0.642.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| cflinuxfs4            | 1.317.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| cf-cli                | 2.3.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.118.0 | <p>▼ v2.118.0</p> <pre> ## 2.118.0 **Release Date**: June 12, 2025 ## Changes - Bumped to golang 1.24.4 - Bumped to jq 1.8 - Go Dependency bumps - △ Removes the ability to configure loggin g.format.timestamp. All logging timestamps ar e now in rfc3339 format for readability. Tha nks @kart2bc! - Adds the ability to specify a default tim eout when using declarative healthchecks in t he event an app does not specify one. ## Bosh Job Spec changes: ``diff diff --git a/jobs/auctioneer/spec b/jobs/au ctioneer/spec index 1fac48936..e7445644b 100644 --- a/jobs/auctioneer/spec +++ b/jobs/auctioneer/spec @@ -99,10 +99,6 @@ properties: description: When set, the auctioneer attem pts to claim a lock from the Locket API. default: true - logging.format.timestamp: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "unix-epoch" - loggregator.use_v2_api: description: "True to use local metron agen t gRPC v2 API. False to use UDP v1 API." default: false diff --git a/jobs/bbs/spec b/jobs/bbs/spec index 49ad1d095..e80fffc064 100644 --- a/jobs/bbs/spec +++ b/jobs/bbs/spec @@ -163,10 +163,6 @@ properties: description: Maximum number of files (inclu ding sockets) the BBS process may have open. default: 100000 - logging.format.timestamp: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which lo gged strings will be truncated. If set to 0, turns off truncation." default: 640 diff --git a/jobs/file_server/spec b/jobs/f ile_server/spec </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> index f530805b3..460201389 100644 --- a/jobs/file_server/spec +++ b/jobs/file_server/spec @@ -60,10 +60,6 @@ properties:   tls.key:     description: "PEM-encoded tls key"   - logging.format.timestamp:     - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'."       - default: "unix-epoch"       -     loggregator.use_v2_api:       description: "Whether component should use the v2 loggregator API when sending data to the metron agent instead of the 'legacy' v1 API."       default: false diff --git a/jobs/locket/spec b/jobs/locket/spec index 640651ffb..6c50d6346 100644 --- a/jobs/locket/spec +++ b/jobs/locket/spec @@ -67,10 +67,6 @@ properties:   diego.locket.sql.ca_cert:     description: "Bundle of CA certificates for the Locket to verify the SQL server SSL certificate when connecting via SSL"   - logging.format.timestamp:     - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'."       - default: "unix-epoch"       -     loggregator.use_v2_api:       description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API."       default: false diff --git a/jobs/rep/spec b/jobs/rep/spec index c7e46eeb5..11d203b4c 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -215,6 +215,9 @@ properties:   diego.executor.max_log_lines_per_second:     description: "EXPERIMENTAL: Maximum log lines allowed per second per app instance. Default value of 0 will disable rate limiting. Minimum recommended value is 100."     default: 0     + diego.executor.declarative_healthcheck_default_timeout:       + description: "Default timeout for declarative healthcheck. This value is used when the LRP spec does not specify a timeout. Only used if 'enable_declarative_healthcheck' is set to true."         + default: "1s" </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> diego.rep.bbs.api_location: description: "Address of the BBS server" @@ -332,10 +335,6 @@ properties: default: [] example: [ "169.254.0.2:15001" ] -   logging.format.timestamp: -     description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -       default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which log strings will be truncated. If set to 0, turns off truncation." default: 640 diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 3383a8bf4..161bc2821 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -61,10 +61,6 @@ properties: description: "Add more permissive ACLs to directories that are bind mounted into containers. Required for Windows 2016 cells" default: false -   logging.format.timestamp: -     description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -       default: "unix-epoch" - logging.max_data_string_length: description: "Length in bytes above which log strings will be truncated. If set to 0, turns off truncation." default: 640 @@ -207,6 +203,9 @@ properties: diego.executor.max_log_lines_per_second: description: "EXPERIMENTAL: Maximum log lines allowed per second per app instance. Default value of 0 will disable rate limiting. Minimum recommended value is 100." default: 0 + diego.executor.declarative_healthcheck_default_timeout: +   description: "Default timeout for declarative healthcheck. This value is used when the LRP spec does not specify a timeout. Only used if 'enable_declarative_healthcheck' is set to true." +     default: "1s" diego.rep.bbs.api_location: description: "Address of the BBS server" diff --git a/jobs/route_emitter/spec b/jobs/route_emitter/spec index df1b8383c..e35eddfb4 100644 </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> --- a/jobs/route_emitter/spec +++ b/jobs/route_emitter/spec @@ -105,10 +105,6 @@ properties:     description: "Experimental: Enable the route-emitter to emit registrations for internal DNS-based service discovery."     default: false -   logging.format.timestamp: -     description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -       default: "unix-epoch" -     tcp.enabled:       description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API."       default: false       diff --git a/jobs/route_emitter_windows/spec b/jobs/route_emitter_windows/spec       index 9db9e8b69..e5a7ac46d 100644       --- a/jobs/route_emitter_windows/spec       +++ b/jobs/route_emitter_windows/spec       @@ -91,10 +91,6 @@ properties:         description: "The name of the Diego job referenced by this spec (DO NOT override)"         default: "route_emitter_windows" -       logging.format.timestamp: -         description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -           default: "unix-epoch" -         syslog_daemon_config.address:           description: "Syslog host"           default: ""           diff --git a/jobs/ssh_proxy/spec b/jobs/ssh_proxy/spec           index cd39dbd52..fe63cfa97 100644           --- a/jobs/ssh_proxy/spec           +++ b/jobs/ssh_proxy/spec           @@ -120,10 +120,6 @@ properties:             description: "Connect directly to container IP instead of to the host IP and external port. Suitable only for deployments in which the gorouters and TCP routers can route directly to the container IP of instances."             default: false -           logging.format.timestamp: -             description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -               default: "unix-epoch" -             loggregator.use_v2_api:               description: "True to use local metron agent gRPC v2 API. False to use UDP v1 API." </pre> |

| <b>Component</b>  | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                | <pre> default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.117.0...v2.118.0">https://github.com/cloudfoundry/diego-release/compare/v2.117.0...v2.118.0</a> ## Resources - [Download release 2.118.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.118.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.118.0</a>). </pre>                                                                                                                                               |
| garden-runc       | 1.73.0         | <p>▼ v1.73.0</p> <pre> ## 1.73.0 **Release Date**: June 11, 2025 ## Changes - Dependency Bumps - Bumped garden to 1.24.4 - Bumped containerd to 2.1.0 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.72.0...v1.73.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.72.0...v1.73.0</a> ## Resources - [Download release 1.73.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.73.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.73.0</a>). </pre> |
| loggregator-agent | 8.3.8          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nfs-volume | 7.32.0  | <p>▼ v7.32.0</p> <pre> ## 7.32.0 **Release Date**: July 15, 2025 ## Go Package Updates for "dockerdriver" * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' ## Go Package Updates for "mapfs" * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0' * Bumped go.mod package 'code.cloudfoundry.org/volumedriver' from 'v0.127.0' to 'v0.129.0' * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0' * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0' * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0' * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0' * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0' ## Go Package Updates for "mapfs-performanc e-acceptance-tests" * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0' * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0' * Bumped go.mod package 'golang.org/x/tools' from 'v0.34.0' to 'v0.35.0' ## Go Package Updates for "nfsbroker" * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.54.0' to 'v0.57.0' * Bumped go.mod package 'code.cloudfoundry.org/existingvolumebroker' from 'v0.173.0' to 'v0.175.0' * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0' * Bumped go.mod package 'code.cloudfoundry.org/service-broker-store' from 'v0.120.0' to 'v0.122.0' * Bumped go.mod package 'code.cloudfoundry.org/volume-mount-options' from 'v0.124.0' to 'v0.126.0' * Bumped go.mod package 'github.com/cloudfoundry/socks5-proxy' from 'v0.2.155' to 'v0.2.156' * Bumped go.mod package 'golang.org/x/crypt </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> o' from 'v0.39.0' to 'v0.40.0'   * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0'     * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0'     * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0'     * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0'     * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'     * Bumped go.mod package 'golang.org/x/tool s' from 'v0.34.0' to 'v0.35.0'     ## Go Package Updates for "nfsv3driver"     * Bumped go.mod package 'code.cloudfoundry. org/cf-networking-helpers' from 'v0.49.0' to 'v0.50.0'     * Bumped go.mod package 'code.cloudfoundry. org/debugserver' from 'v0.54.0' to 'v0.57.0'     * Bumped go.mod package 'code.cloudfoundry. org/dockerdriver' from 'v0.54.0' to 'v0.55.0'     * Bumped go.mod package 'code.cloudfoundry. org/goshims' from 'v0.69.0' to 'v0.71.0'     * Bumped go.mod package 'code.cloudfoundry. org/volume-mount-options' from 'v0.124.0' to 'v0.126.0'     * Bumped go.mod package 'code.cloudfoundry. org/volumedriver' from 'v0.127.0' to 'v0.129. 0'     * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0'     * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0'     * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0'     * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0'     * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'     * Bumped go.mod package 'golang.org/x/tool s' from 'v0.34.0' to 'v0.35.0'     ## Built with go 1.24.4     **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.31.0...v7.32.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.31.0...v7.32.0</a>     ## Resources     - [Download release 7.32.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/nfs-volume-release?version=7.32.0). </pre> |
|           |         | <p>▼ v7.31.0</p> <pre> ## 7.31.0 **Release Date**: July 11, 2025 ## Blob Updates * Bumped blob openssl from '3.5.0' to '3.5. 1' </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ## Go Package Updates for "dockerdriver" * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0'   * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "mapfs" * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "mapfs-performanc e-acceptance-tests" * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "nfsbroker" * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0'   * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.54.0'     * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0'       * Bumped go.mod package 'code.cloudfoundry.org/credhub-cli' from 'v0.0.0-20250616130814-79ad10d5e505' to 'v0.0.0-20250630133601-61e52f0de0d8'         * Bumped go.mod package 'github.com/cloudfoundry/socks5-proxy' from 'v0.2.154' to 'v0.2. 155'         * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Go Package Updates for "nfsv3driver" * Bumped go.mod package 'code.cloudfoundry.org/cf-networking-helpers' from 'v0.48.0' to 'v0.49.0'   * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.54.0'     * Bumped go.mod package 'code.cloudfoundry.org/dockerdriver' from 'v0.53.0' to 'v0.54.0'       * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0'         * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0'         * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0'           * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0'             * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.30.0...v7.31.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.30.0...v7.31.0</a> ## Resources - [Download release 7.31.0 from bosh.io](ht </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p><a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.31.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.31.0</a>.</p> <p>▼ v7.30.0</p> <pre> ## 7.30.0 **Release Date**: June 26, 2025 ## Changes - Allows operators to completely override the metadata used by BBR for backup + restore locks ## Bosh Job Spec changes: ```diff diff --git a/jobs/nfsbroker-bbr-lock/spec b/jobs/nfsbroker-bbr-lock/spec index 101e79dc..8abee21e 100644 --- a/jobs/nfsbroker-bbr-lock/spec +++ b/jobs/nfsbroker-bbr-lock/spec @@ -11,3 +11,31 @@ consumes: - name: nfsbrokerpush type: nfsbrokerpush +properties: + bbr.metadata: +   description: "BBR Metadata" +   default:   +     --- +     backup_should_be_locked_before: +       - job_name: uaa +         release: uaa +       - job_name: credhub +         release: credhub +       - job_name: cloud_controller_ng +         release: capi +       - job_name: cloud_controller_worker +         release: capi +       - job_name: cc_deployment_updater +         release: capi + +     restore_should_be_locked_before: +       - job_name: uaa +         release: uaa +       - job_name: credhub +         release: credhub +       - job_name: cloud_controller_ng +         release: capi +       - job_name: cloud_controller_worker +         release: capi +       - job_name: cc_deployment_updater +         release: capi ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.29.0...v7.30.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.29.0...v7.30.0</a> ## Resources - [Download release 7.30.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.30.0) </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre>y/nfs-volume-release?version=7.30.0).  ▼ v7.29.0  ## 7.29.0 **Release Date**: June 24, 2025 ## Changes - Bump to OpenLDAP 2.6.10 for testing - Bump to Golang 1.24.4 - △Removed the ability for operators to configure logging timestamps. RFC3339 timestamps are now always used. ## Bosh Job Spec changes: ```diff diff --git a/jobs/nfsbrokerpush/spec b/jobs/nfsbrokerpush/spec index bb67a949..b8919abf 100644 --- a/jobs/nfsbrokerpush/spec +++ b/jobs/nfsbrokerpush/spec @@ -123,6 +123,3 @@ properties: nfsbrokerpush.log_level: description: "nfsbroker log level" default: "info" - nfsbrokerpush.log_time_format: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "rfc3339" diff --git a/jobs/nfsv3driver/spec b/jobs/nfsv3driver/spec index 7d5262d8..ceb3f10d 100644 --- a/jobs/nfsv3driver/spec +++ b/jobs/nfsv3driver/spec @@ -42,9 +42,6 @@ properties: nfsv3driver.log_level: description: "nfsv3driver log level" default: "info" - nfsv3driver.log_time_format: -   description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." -   default: "rfc3339" nfsv3driver.disable: description: "disable nfsv3driver" default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.28.0...v7.29.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.28.0...v7.29.0</a> ## Resources - [Download release 7.29.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.29.0).</pre> |

| Component      | Version | Release Notes |
|----------------|---------|---------------|
| otel-collector | 0.11.4  |               |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.342.0 | <p>▼ v0.342.0</p> <pre> ## 0.342.0 **Release Date**: July 07, 2025 ## Changes - Bump blob `jq` from 1.8.0 to 1.8.1 - Bump go package `tlsconfig` from v0.29.0 to v0.30.0 - Bump go package `github.com/cloudfoundry/cf-test-helpers/v2` from v2.12.0 to v2.13.0 - Bump go package `github.com/nats-io/nats-server/v2` from v2.11.4 to v2.11.5 - Bump go package `code.cloudfoundry.org/bbs` from `v0.0.0-20250414163106-a163a3b524d2` to `v0.0.0-20250627143703-e88b3ec8cd1e` - Bump go package `github.com/prometheus/common` from v0.64.0 to v0.65.0 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.341.0...v0.342.0">https://github.com/cloudfoundry/routing-release/compare/v0.341.0...v0.342.0</a> ## Resources - [Download release 0.342.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.342.0). </pre> <p>▼ v0.341.0</p> <pre> ## 0.341.0 **Release Date**: June 24, 2025 ## Changes - Added the ability for operators to completely override the BBR metadata to control what restores block on. - △ Removed the deprecated router.max_header_kb property. Please use router.max_request_header_kb. Thanks @kart2bc ! - △ Removed the ability for operators to configure logging timestamps. Only RFC3339 is permitted now. Thanks @kart2bc ! - Bumped to a newer version of the cf-cli for acceptance tests ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 8378da138..a9e55d41a 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -287,20 +287,13 @@ properties:     router.route_services_strict_signature_validation:       description: "Enforce strict validation of a route service signature"       default: false       - router.max_header_kb: </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <ul style="list-style-type: none"> <li>- description:  </li> <li>- Deprecated, use router.max_request_header_kb instead which is equivalent to this option.</li> <li>- default: 1024 # 1Mb</li> <li>router.max_request_header_kb:</li> <li>description:  </li> <li>This value controls the maximum number of bytes (in KB) the gorouter will read parsing the request header's keys and values, including the request line. It does not limit the size of the request body. Requests with larger headers will result in a 431 status code. Must be between 1 and 1024kb.</li> <li>- Note: This value takes precedence over router.max_header_kb but has no default to not break</li> <li>- existing setups. If you previously configured router.max_header_kb it is recommended to</li> <li>- switch to this property instead.</li> <li>- example: 1024 # 1Mb</li> <li>+ default: 1024 # 1Mb</li> <li>router.max_response_header_kb:</li> <li>description:  </li> <li>This value controls the maximum number of bytes (in KB) the gorouter will read @@ -352,13 +345,6 @@ properties: stderr logs.</li> <li>Available fields are: backend_time, dial_time, dns_time, failed_attempts, failed_attempt_time, local_address, tls_time</li> <li>default: []</li> <li>- router.logging.format.timestamp:</li> <li>- description:  </li> <li>- Format for timestamp in component logs. Valid values are 'rfc3339', 'deprecated', and 'unix-epoch'.</li> <li>- 'rfc3339' is the recommended format. It will result in all timestamps controlled by gorouter to be in RFC3339 format, which is human readable. This includes stdout, pre-start, and post-start logs. This does not include stderr logs from golang libraries.</li> <li>- 'deprecated' will result in all timestamps being in the format they were before the rfc3339 flag was introduced. This format is different for different logs. We do not recommend using this flag unless you have scripts that expect a particular timestamp format.</li> <li>- 'unix-epoch' is an old flag that we do not recommend using, but we are keeping for backwards compatibility. It will result in the gorouter logs to be in unix-epoch format. This does not effect pre-start or post-start logs. This does not effect stderr logs from g</li> </ul> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> olang libraries. - default: "rfc3339" router.enable_proxy: description: "Enables support for the popular PROXY protocol, allowing downstream load balancers that do not support HTTP to pass along client information." default: false diff --git a/jobs/routing-api/spec b/jobs/routing-api/spec index bea7e6ca1..751eefe2f 100644 --- a/jobs/routing-api/spec +++ b/jobs/routing-api/spec @@ -232,6 +232,13 @@ properties: description: "Local port to listen on with admin endpoint (used for backup/restore locking)" default: 15897 + routing_api.bbr.metadata: + description: "BBR Metadata" + default:   +   --- +   restore_should_be_locked_before: +   - job_name: uaa +   release: uaa release_level_backup: default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.340.0...v0.341.0">https://github.com/cloudfoundry/routing-release/compare/v0.340.0...v0.341.0</a> ## Resources - [Download release 0.341.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.341.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.341.0</a>). </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| silk      | 3.72.0  | <p>▼ v3.72.0</p> <pre> ## 3.72.0 **Release Date**: June 16, 2025 ## Changes - Breaking Change: remove `logging.format.timestamp` property from multiple jobs. - RFC339 forever! - <a href="https://github.com/cloudfoundry/silk-release/pull/159">https://github.com/cloudfoundry/silk-release/pull/159</a> - Thank you @kart2bc - Bump dependencies ## Bosh Job Spec changes: ``` diff --git a/jobs/iptables-logger/spec b/jobs/iptables-logger/spec index d5ac9fe7..e9538f18 100644 --- a/jobs/iptables-logger/spec +++ b/jobs/iptables-logger/spec @@ -26,10 +26,3 @@ properties:  disable:  description: "Disable this monit job. It will not run. Required for backwards compatibility"  default: false - - logging.format.timestamp: -   description:   -     Format for timestamp in component logs. Valid values are 'rfc3339', 'deprecated'. -     'rfc3339' is the recommended format. It will result in all timestamps controlled by iptables-logger to be in RFC3339 format, which is human readable. -     'deprecated' will result in all timestamps being in the format they were before the rfc3339 flag was introduced. This format is different for different logs. We do not recommend using this flag unless you have scripts that expect a particular timestamp format. -   default: "rfc3339" diff --git a/jobs/silk-daemon/spec b/jobs/silk-daemon/spec index 572b08c9..b3c12b4e 100644 --- a/jobs/silk-daemon/spec +++ b/jobs/silk-daemon/spec @@ -105,14 +105,6 @@ properties:  description: "Log Level for silk-daemon to start with"  default: info - logging.format.timestamp: -   description:   -     Format for timestamp in the drain log. Valid values are 'rfc3339' and 'deprecated'. -     This property only affects the drain log because other component and bosh lifecycle logs were already in the rfc3339 format. -   default: "rfc3339" </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>t. It will result in all timestamps in the drain log controlled by silk-daemon to be in RFC3339 format, which is human readable. This does not include stderr logs from golang libraries.</p> <ul style="list-style-type: none"> <li>- 'deprecated' will result in all timestamps being in the format they were before the rfc3339 flag was introduced for the drain log. We do not recommend using this flag unless you have scripts that expect a particular timestamp format.</li> <li>- default: "rfc3339"</li> <li>-</li> </ul> <pre>healthchecker.failure_counter_file: description: "File used by the healthchecker to monitor consecutive failures." default: /var/vcap/data/silk-daemon/counters/consecutive_healthchecker_failures.count ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.71.0...v3.72.0">https://github.com/cloudfoundry/silk-release/compare/v3.71.0...v3.72.0</a> ## Resources - [Download release 3.72.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.72.0).</pre> <p>▼ v3.71.0</p> <pre>## 3.71.0 **Release Date**: June 11, 2025 ## Changes - Dependency bumps - Bumped to go 1.24.4 ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.70.0...v3.71.0">https://github.com/cloudfoundry/silk-release/compare/v3.70.0...v3.71.0</a> ## Resources - [Download release 3.71.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.71.0).</pre> |

| Component  | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| smb-volume | 3.30.0  | <p>▼ v3.30.0</p> <pre> ## 3.30.0 **Release Date**: July 15, 2025 ## Go Package Updates for "dockerdriver" * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b36a' to 'v0.0.0-20250630185457-6e76a2b096b5' * ## Go Package Updates for "smbbroker" * Bumped go.mod package 'code.cloudfoundry.org/clock' from 'v1.40.0' to 'v1.41.0' * Bumped go.mod package 'code.cloudfoundry.org/debugserver' from 'v0.53.0' to 'v0.57.0' * Bumped go.mod package 'code.cloudfoundry.org/existingvolumebroker' from 'v0.173.0' to 'v0.175.0' * Bumped go.mod package 'code.cloudfoundry.org/goshims' from 'v0.69.0' to 'v0.71.0' * Bumped go.mod package 'code.cloudfoundry.org/lager/v3' from 'v3.39.0' to 'v3.40.0' * Bumped go.mod package 'code.cloudfoundry.org/service-broker-store' from 'v0.120.0' to 'v0.122.0' * Bumped go.mod package 'code.cloudfoundry.org/volume-mount-options' from 'v0.124.0' to 'v0.126.0' * Bumped go.mod package 'code.cloudfoundry.org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0' * Bumped go.mod package 'code.cloudfoundry.org/credhub-cli' from 'v0.0.0-20250616130814-79ad10d5e505' to 'v0.0.0-20250630133601-61e52f0de0d8' * Bumped go.mod package 'code.cloudfoundry.org/dockerdriver' from 'v0.53.0' to 'v0.55.0' * Bumped go.mod package 'code.cloudfoundry.org/volumedriver' from 'v0.127.0' to 'v0.129.0' * Bumped go.mod package 'github.com/cloudfoundry/socks5-proxy' from 'v0.2.154' to 'v0.2.156' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250629210550-e611ec304b22' to 'v0.0.0-20250630185457-6e76a2b096b5' * Bumped go.mod package 'golang.org/x/crypto' from 'v0.39.0' to 'v0.40.0' * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0' * Bumped go.mod package 'golang.org/x/sys'</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> from 'v0.33.0' to 'v0.34.0'   * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'   * Bumped go.mod package 'golang.org/x/tool s' from 'v0.34.0' to 'v0.35.0'   ## Go Package Updates for "smbdriver"   * Bumped go.mod package 'code.cloudfoundry. org/debugserver' from 'v0.53.0' to 'v0.57.0'   * Bumped go.mod package 'code.cloudfoundry. org/dockerdriver' from 'v0.53.0' to 'v0.55.0'   * Bumped go.mod package 'code.cloudfoundry. org/goshims' from 'v0.69.0' to 'v0.71.0'   * Bumped go.mod package 'code.cloudfoundry. org/lager/v3' from 'v3.39.0' to 'v3.40.0'   * Bumped go.mod package 'code.cloudfoundry. org/volume-mount-options' from 'v0.124.0' to 'v0.126.0'   * Bumped go.mod package 'code.cloudfoundry. org/volumedriver' from 'v0.127.0' to 'v0.129. 0'   * Bumped go.mod package 'code.cloudfoundry. org/cfhttp/v2' from 'v2.47.0' to 'v2.48.0'   * Bumped go.mod package 'code.cloudfoundry. org/clock' from 'v1.40.0' to 'v1.41.0'   * Bumped go.mod package 'github.com/google/ pprof' from 'v0.0.0-20250629210550-e611ec304b 22' to 'v0.0.0-20250630185457-6e76a2b096b5'   * Bumped go.mod package 'golang.org/x/mod' from 'v0.25.0' to 'v0.26.0'   * Bumped go.mod package 'golang.org/x/net' from 'v0.41.0' to 'v0.42.0'   * Bumped go.mod package 'golang.org/x/sync' from 'v0.15.0' to 'v0.16.0'   * Bumped go.mod package 'golang.org/x/sys' from 'v0.33.0' to 'v0.34.0'   * Bumped go.mod package 'golang.org/x/text' from 'v0.26.0' to 'v0.27.0'   * Bumped go.mod package 'golang.org/x/tool s' from 'v0.34.0' to 'v0.35.0'   ## Built with go 1.24.4   **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.29.0...v3.30.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.29.0...v3.30.0</a>   ## Resources   - [Download release 3.30.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/smb-volume-release?version=3.30.0). </pre> |

#### ▼ v3.29.0

```

## 3.29.0
**Release Date**: July 11, 2025
## Go Package Updates for smbbroker
* Bumped go.mod package 'code.cloudfoundry.
org/tlsconfig' from 'v0.29.0' to 'v0.30.0'
  * Bumped go.mod package 'github.com/google/
pprof' from 'v0.0.0-20250607225305-033d6d78b3

```

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> 6a' to 'v0.0.0-20250629210550-e611ec304b22' ## Go Package Updates for smbdriver * Bumped go.mod package 'code.cloudfoundry.org/tlsconfig' from 'v0.29.0' to 'v0.30.0' * Bumped go.mod package 'github.com/google/pprof' from 'v0.0.0-20250607225305-033d6d78b3 6a' to 'v0.0.0-20250629210550-e611ec304b22' ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.28.0...v3.29.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.28.0...v3.29.0</a>  ## Resources - [Download release 3.29.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.29.0). </pre> <p>▼ v3.28.0</p> <pre> ## 3.28.0 **Release Date**: June 24, 2025 ## Changes - Adds the ability for operators to completely override the bbr metadata for what jobs to block on during backup/restore events. ## Bosh Job Spec changes: ``` diff --git a/jobs/bbr-smbbroker/spec b/jobs/bbr-smbbroker/spec index 8b8027d..54b451d 100644 --- a/jobs/bbr-smbbroker/spec +++ b/jobs/bbr-smbbroker/spec @@ -8,3 +8,32 @@ templates: consumes: - name: smbbrokerpush type: smbbrokerpush + +properties: + bbr.metadata: +   description: "BBR Metadata" +   default:   +   --- +   backup_should_be_locked_before: +     - job_name: uaa +       release: uaa +     - job_name: credhub +       release: credhub +     - job_name: cloud_controller_ng +       release: capi +     - job_name: cloud_controller_worker +       release: capi +     - job_name: cc_deployment_updater +       release: capi + +   restore_should_be_locked_before: +     - job_name: uaa +       release: uaa +     - job_name: credhub ``` </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> +       release: credhub +       - job_name: cloud_controller_ng +       release: capi +       - job_name: cloud_controller_worker +       release: capi +       - job_name: cc_deployment_updater +       release: capi ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.27.0...v3.28.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.27.0...v3.28.0</a>  ## Resources - [Download release 3.28.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.28.0). </pre> <p>▼ v3.27.0</p> <pre> ## 3.27.0 **Release Date**: June 23, 2025 ## Changes - Bump to golang 1.24.4 - ⚠️Breaking change: logging time formats are now only able to be the human-readable rfc339 format. Thanks @kart2bc! ## Bosh Job Spec changes: ```diff diff --git a/jobs/smbbrokerpush/spec b/jobs/smbbrokerpush/spec index 18030a3..ca6e9a6 100644 --- a/jobs/smbbrokerpush/spec +++ b/jobs/smbbrokerpush/spec @@ -119,6 +119,3 @@ properties: log_level: description: "smbbroker log level" default: "info" - log_time_format: - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." - default: "rfc3339" diff --git a/jobs/smbdriver/spec b/jobs/smbdriver/spec index aa6dba3..e06b8df 100755 --- a/jobs/smbdriver/spec +++ b/jobs/smbdriver/spec @@ -35,9 +35,6 @@ properties: log_level: description: "smbdriver log level" default: "info" - log_time_format: - description: "Format for timestamp in component logs. Valid values are 'unix-epoch' and 'rfc3339'." - default: "rfc3339" disable: </pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |         | <pre>description: "disable smbdriver" default: false ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.26.0...v3.27.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.26.0...v3.27.0</a> ## Resources - [Download release 3.27.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.27.0).</pre> |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| syslog            | 12.3.9  |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                               |

## 6.0.17

**Release Date:** 06/17/2025

- Bump cflinuxfs3 to version [0.638.0](#)
- Bump cflinuxfs4 to version [1.311.0](#)
- Bump cf-cli to version [2.3.0](#)
- Bump garden-runc to version [1.72.0](#)
- Bump nfs-volume to version [7.28.0](#)
- Bump routing to version [0.340.0](#)
- Bump smb-volume to version [3.26.0](#)

| Component             | Version | Release Notes |
|-----------------------|---------|---------------|
| ubuntu-jammy stemcell | 1.824   |               |
| bpm                   | 1.4.20  |               |
| cf-networking         | 3.70.0  |               |
| cflinuxfs3            | 0.638.0 |               |
| cflinuxfs4            | 1.311.0 |               |

| Component             | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cf-cli                | 2.3.0   | <p>▼ v2.3.0</p> <pre>### Included CF CLI versions:<br/>8.14.1</pre> <p>▼ v2.2.0</p> <pre>### Included CF CLI versions:<br/>8.14.0</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| count-cores-indicator | 2.0.0   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| diego                 | 2.117.0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| garden-runc           | 1.72.0  | <p>▼ v1.72.0</p> <pre>## 1.72.0<br/>**Release Date**: May 16, 2025<br/>## Changes<br/>- Update dependencies<br/>## Built with go 1.24.3<br/>**Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.71.0...v1.72.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.71.0...v1.72.0</a><br/>## Resources<br/>- [Download release 1.72.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.72.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.72.0</a>).</pre>                       |
| loggregator-agent     | 8.3.8   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| nfs-volume            | 7.28.0  | <p>▼ v7.28.0</p> <pre>## 7.28.0<br/>**Release Date**: May 16, 2025<br/>## Changes<br/>- Bump dependencies<br/>- Bump to golang 1.24.3<br/>## Built with go 1.24.3<br/>**Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.27.0...v7.28.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.27.0...v7.28.0</a><br/>## Resources<br/>- [Download release 7.28.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.28.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.28.0</a>).</pre> |
| otel-collector        | 0.11.4  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| routing   | 0.340.0 | <p>▼ v0.340.0</p> <pre> ## 0.340.0 **Release Date**: June 06, 2025 ## Changes - Bumped to golang 1.24.4 - Bumped to jq 1.8.0 ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index a88b19ab..8378da13 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -255,6 +255,10 @@ properties: Maximum number of attempts on failing requests against route service URLs.  The minimum value for this setting is 1. This prevents gorouter from getting blocked by indefinite retries. default: 3 + router.route_services.enable_websockets: +   description:   +     Enable websocket connections for application routes bound to Route Services. +   default: true router.route_services.cert_chain: description: Certificate chain used for client authentication to TLS-registered route services. In PEM format. router.route_services.private_key: ``` ## Built with go 1.24.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.339.0...v0.340.0">https://github.com/cloudfoundry/routing-release/compare/v0.339.0...v0.340.0</a> ## Resources - [Download release 0.340.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.340.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.340.0</a>). </pre> <p>▼ v0.339.0</p> <pre> ## 0.339.0 **Release Date**: June 04, 2025 ## Changes - feat: RouteAdded and RouteDeleted metrics have been introduced - <a href="https://github.com/cloudfoundry/routing-release/pull/478/commits/a3c548753844a3519c3e5e1a18f08b9f7219d776">https://github.com/cloudfoundry/routing-release/pull/478/commits/a3c548753844a3519c3e5e1a18f08b9f7219d776</a>. Thanks @Soha-Albaghdady / @maxmoehl - feat: websockets are now supported via route services by default and can be disabled via: `router.route_services.enable_websockets: false`. <a href="https://github.com/cloudfoundry/routing-release/pull/474">https://github.com/cloudfoundry/routing-release/pull/474</a>. Thanks @Dariquest / @max </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> moehl   - refactor: 100-continue specific proxy has     been removed, golang 1.23 handles it correctl     y - https://github.com/cloudfoundry/routing-r     elease/pull/483. Thanks @geofffranks   - refactor: route registry metrics have bee     n fixed to report correct result https://gith     ub.com/cloudfoundry/routing-release/issues/46     8 and https://github.com/cloudfoundry/routing-     release/pull/478. Thanks @maxmoehl / @hoffma     en   - ci: PR validation has been introduced to     run linters and unit/integration tests. Trigg     er PR validation via label `ready-to-run`. Th     anks @kart2bc   - misc: pre-start checks below were merged     prior to 0.338.0 via https://github.com/cloud     foundry/routing-release/pull/481. They are ke     pt for reference and were missed during CI mi     grations   ## Bosh Job Spec changes:   ``diff   diff --git a/jobs/tcp_router/spec b/jobs/tc   p_router/spec   index aa6b764c..234e3db9 100644   --- a/jobs/tcp_router/spec   +++ b/jobs/tcp_router/spec   @@ -19,6 +19,7 @@ templates:     haproxy.conf.template.erb: config/haproxy.c     onf.template     bpm.yml.erb: config/bpm.yml     drain.erb: bin/drain     + pre-start.erb: bin/pre-start     post-start.erb: bin/post-start     packages:     ```    ## Built with go 1.24.3   **Full Changelog**: https://github.com/clou   dfoundry/routing-release/compare/v0.338.0...v   0.339.0   ## Resources   - [Download release 0.339.0 from bosh.io](h   ttps://bosh.io/releases/github.com/cloudfound   ry/routing-release?version=0.339.0). </pre> <p>▼ v0.338.0</p> <pre> ## 0.338.0 **Release Date**: May 16, 2025 ## Changes - Update dependencies ## Built with go 1.24.3 **Full Changelog**: https://github.com/clou dfoundry/routing-release/compare/v0.337.0...v 0.338.0 ## Resources - [Download release 0.338.0 from bosh.io](h </pre> |

| Component         | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |         | <a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.338.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.338.0</a> .                                                                                                                                                                                                                                                                                                              |
| silk              | 3.70.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| smb-volume        | 3.26.0  | <p>▼ v3.26.0</p> <pre>## 3.26.0 **Release Date**: May 16, 2025 ## Changes - Bumped dependencies - BUmped golang to 1.24.3 ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.25.0...v3.26.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.25.0...v3.26.0</a> ## Resources - [Download release 3.26.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.26.0).</pre> |
| smoke-tests       | 4.10.0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| syslog            | 12.3.9  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| tanzu-jammy-stack | 1.0.1   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## 6.0.16

**Release Date:** 05/15/2025

- Bump bpm to version [1.4.20](#)
- Bump cf-networking to version [3.70.0](#)
- Bump cflinuxfs3 to version [0.630.0](#)
- Bump cflinuxfs4 to version [1.302.0](#)
- Bump cf-cli to version [2.1.0](#)
- Bump diego to version [2.117.0](#)
- Bump garden-runc to version [1.71.0](#)
- Bump loggregator-agent to version [8.3.8](#)
- Bump nfs-volume to version [7.27.0](#)
- Bump routing to version [0.337.0](#)
- Bump silk to version [3.70.0](#)
- Bump smb-volume to version [3.25.0](#)

| <b>Component</b>      | <b>Version</b> | <b>Release Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ubuntu-jammy stemcell | 1.808          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| bpm                   | 1.4.20         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cf-networking         | 3.70.0         | <p>▼ v3.70.0</p> <pre> ## 3.70.0 **Release Date**: May 09, 2025 ## Changes - Bug Fix: Add migrations to rollback the bad v0082 and v0083 migrations. <a href="https://github.com/cloudfoundry/cf-networking-release/pull/326">https://github.com/cloudfoundry/cf-networking-release/pull/326</a> - Thank you @mariash and @geofffranks! See these two docs on the issues this fixes: - [Known Issue: policy server pre-start fails] (<a href="https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/12-known-issue-asgs-with-too-many-bound-spaces.md">https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/12-known-issue-asgs-with-too-many-bound-spaces.md</a>) - [Known Issue: policy server ASG syncer fails in crash loop] (<a href="https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/13-known-issue-policy-server-asg-syncer-crash-loop.md">https://github.com/cloudfoundry/cf-networking-release/blob/develop/docs/13-known-issue-policy-server-asg-syncer-crash-loop.md</a>) ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.69.0...v3.70.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.69.0...v3.70.0</a> ## Resources - Download release 3.70.0 from <a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.70.0">bosh.io</a>. </pre> |
| cflinuxfs3            | 0.630.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cflinuxfs4            | 1.302.0        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| cf-cli                | 2.1.0          | <p>▼ v2.1.0</p> <pre> ### Included CF CLI versions: 8.13.0 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| count-cores-indicator | 2.0.0          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| diego     | 2.117.0 | <p>▼ v2.117.0</p> <pre> ## 2.117.0 **Release Date**: May 06, 2025 ## Changes - Upgrade to go 1.24 - New property: `diego.rep.extra_root_fs_directory` (thanks @winkingturtle-vmw!) - Directory for extra desired root fses to be used by rep - New properties: `diego.executor.proxy_healthcheck_interval` and `diego.executor.enable_container_proxy_healthcheck` (thanks @Viktor-Velkov!) - Configuration for envoy proxy healthchecks - `cnbapplifecycle` is now a standalone module - Add BBS Advanced Metrics <a href="https://github.com/cloudfoundry/diego-release/pull/996">https://github.com/cloudfoundry/diego-release/pull/996</a> (thanks @sandalski and @PlamenDoychev!) ## Bosh Job Spec changes: ``diff diff --git a/jobs/bbs/spec b/jobs/bbs/spec index 9204a8d4c..49ad1d095 100644 --- a/jobs/bbs/spec +++ b/jobs/bbs/spec @@ -147,6 +147,18 @@ properties: description: "Timeout in seconds to receive a response to the keepalive ping. If a response is not received within this time, the lock et client will reconnect to another server." default: 22 + diego.bbs.metrics.advanced_metrics.enabled: +   description: Enables emitting BBS Metrics per specified routes/endpoints in advance d_metrics, useful for debugging issues. May i mpact performances. +   default: false + + diego.bbs.metrics.advanced_metrics.route _config.request_count: +   description: Set the routes for which request_count should be emitted. If empty, no request_count metrics will be emitted. +   default: [] + + diego.bbs.metrics.advanced_metrics.route _config.request_latency: +   description: Set the routes for which request_latency should be emitted. If empty, no request_latency metrics will be emitted. +   default: [] + limits.open_files: description: Maximum number of files (inclu </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> ding sockets) the BBS process may have open.       default: 100000       diff --git a/jobs/rep/spec b/jobs/rep/spec       index ecff35fa5..c7e46eeb5 100644       --- a/jobs/rep/spec       +++ b/jobs/rep/spec       @@ -57,6 +57,9 @@ properties:         diego.rep.sidecar_rootfs_path:           description: "absolute_path representing th           e root filesystem used for sidecar processes           (ie. '/var/vcap/packages/cflinuxfs4/rootfs.ta           r'). Must be one of the preloaded_rootfses pa           ths. Leaving the default empty string is ok,           as it will then select the first of he preloa           ded_rootfses"           default: ""         + diego.rep.extra_root_fs_dir:           +   description: "dir to scan for extra ro           ots to be loaded by rep"           +   default: "/var/vcap/store/rootfses"         diego.rep.rootfs_providers:           description: "Array of schemes for which th           e underlying garden can support arbitrary roo           t filesystems"           default:             @@ -138,6 +141,12 @@ properties:               diego.executor.use_schedulable_disk_size:                 description: "Use total space available to                 containers reported by Garden. If false the t                 otal size of image plugin store minus max_cac                 he_size_in_bytes is used."                 default: false                 + diego.executor.proxy_healthcheck_interva                 l:                   +   description: "Interval that checks env                   oy responsiveness every 30s."                   +   default: "30s"                   + diego.executor.enable_container_proxy_he                   althcheck:                     +   description: "When set, enables the li                     veness health check for the envoy proxy in th                     e container."                     +   default: false                   diego.executor.garden.address:                     description: "Garden server listening addre                     ss."                     default: /var/vcap/data/garden/garden.sock                     diff --git a/jobs/rep_windows/spec b/jobs/r                     ep_windows/spec                     index d34483c0b..3383a8bf4 100644                     --- a/jobs/rep_windows/spec                     +++ b/jobs/rep_windows/spec                     @@ -48,6 +48,9 @@ properties:                       diego.rep.sidecar_rootfs_path:                         description: "absolute_path representing th                         e root filesystem used for sidecar processes                         (ie. '/tmp/windows2012R2'). Must be one of th </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> e preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses"     default: ""     + diego.rep.extra_root_fs_dir:     +   description: "dir to scan for extra rootfs to be loaded by rep"     +   default: "/var/vcap/store/rootfses"     diego.rep.rootfs_providers:       description: "Array of schemes for which the underlying garden can support arbitrary root filesystems"       default: [] @@ -133,6 +136,12 @@ properties:     diego.executor.use_schedulable_disk_size:       description: "Use total space available to containers reported by Garden. If false the total size of image plugin store minus max_cache_size_in_bytes is used."       default: false       + diego.executor.proxy_healthcheck_interval:         +   description: "Interval that checks envoy responsiveness."         +   default: "30s"         +   diego.executor.enable_container_proxy_healthcheck:           +   description: "When set, enables the liveness health check for the envoy proxy in the container."           +   default: false         diego.executor.garden.address:           description: "Garden server listening address."           default: 127.0.0.1:9241         diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec           index 901e5236d..b42ae9d49 100644           --- a/jobs/vizzini/spec           +++ b/jobs/vizzini/spec           @@ -1,7 +1,7 @@           ---           name: vizzini           packages:             - - golang-1.23-linux             + - golang-1.24-linux             - vizzini           templates:             ``             ## Built with go 1.24.2             **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.116.0...v2.117.0">https://github.com/cloudfoundry/diego-release/compare/v2.116.0...v2.117.0</a>             ## Resources             - [Download release 2.117.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release/v2.117.0) </pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <p>ry/diego-release?version=2.117.0).</p> <p>▼ v2.116.0</p> <pre>## 2.116.0 **Release Date**: March 28, 2025 ## Changes - bump go version ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.115.0...v2.116.0">https://github.com/cloudfoundry/diego-release/compare/v2.115.0...v2.116.0</a> ## Resources - [Download release 2.116.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.116.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.116.0</a>).</pre> <p>▼ v2.115.0</p> <pre>## 2.115.0 **Release Date**: February 24, 2025 ## Changes - Expose configuration option to select rootfs used for container's sidecar processes. This configuration resolves the following issue [983] (<a href="https://github.com/cloudfoundry/diego-release/issues/983">https://github.com/cloudfoundry/diego-release/issues/983</a>) observed on systems running with multiple FS stacks. Thanks to @Ivo1116 , @PlamenDoychev! ## Bosh Job Spec changes: ```diff diff --git a/jobs/rep/spec b/jobs/rep/spec index 012234e12..ecff35fa5 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -54,6 +54,9 @@ properties: default: false diego.rep.preloaded_rootfses: description: "Array of name:absolute_path pairs representing root filesystems preloaded onto the underlying garden" + diego.rep.sidecar_rootfs_path: + description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/var/vcap/packages/cflinuxfs4/rootfs.tar'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses" + default: "" diego.rep.rootfs_providers: description: "Array of schemes for which the underlying garden can support arbitrary root filesystems" default:</pre> |

| Component | Version | Release Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |         | <pre> diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 4a7dfefc6..d34483c0b 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -45,6 +45,9 @@ properties: description: "Array of name:absolute_path pairs representing root filesystems preloaded onto the underlying garden" default: - windows2012R2:/tmp/windows2012R2 + diego.rep.sidecar_rootfs_path: + description: "absolute_path representing the root filesystem used for sidecar processes (ie. '/tmp/windows2012R2'). Must be one of the preloaded_rootfses paths. Leaving the default empty string is ok, as it will then select the first of the preloaded_rootfses" + default: "" diego.rep.rootfs_providers: description: "Array of schemes for which the underlying garden can support arbitrary root filesystems" default: [] ``` ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.114.0...v2.115.0">https://github.com/cloudfoundry/diego-release/compare/v2.114.0...v2.115.0</a> ## Resources - [Download release 2.115.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.115.0). </pre> |

#### ▼ v2.114.0

```

## 2.114.0
**Release Date**: February 18, 2025
## Changes
- Add support to Diego for file-based service bindings - https://github.com/cloudfoundry/diego-release/pull/990 - Thank you @klapkov, @dimitardimitrov13!
## Bosh Job Spec changes:
```diff
diff --git a/jobs/rep/spec b/jobs/rep/spec
index 0737d9d1a..012234e12 100644
--- a/jobs/rep/spec
+++ b/jobs/rep/spec
@@ -22,7 +22,8 @@ templates:
tls.key.erb: config/certs/tls.key
tls_ca.crt.erb: config/certs/tls_ca.crt
indicators.yml.erb: config/indicators.yml
-
+ volume_mounted_files.erb: bin/volume_mounted_files
+

```

Component	Version	Release Notes
		<pre> packages: - pid_utils - rep ``` ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.113.0...v2.114.0">https://github.com/cloudfoundry/diego-release/compare/v2.113.0...v2.114.0</a> ## Resources - [Download release 2.114.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.114.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.114.0</a>). </pre>
	▼ v2.113.0	<pre> ## 2.113.0 **Release Date**: February 03, 2025 ## Changes - ⚠ BREAKING CHANGE: `chacha20-poly1305@openssh.com` has been removed from the default allowed ciphers for ssh-proxy. <a href="https://github.com/cloudfoundry/diego-ssh/pull/62">https://github.com/cloudfoundry/diego-ssh/pull/62</a> Thank you @DimitarSch - Bump dependencies - <a href="https://github.com/cloudfoundry/diego-release/pull/986">https://github.com/cloudfoundry/diego-release/pull/986</a> Keep `filepath-securejoin` at `v0.3.6` until `runc` is compatible with `v0.4.0` (thanks @winkingturtle-vmw) ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.112.0...v2.113.0">https://github.com/cloudfoundry/diego-release/compare/v2.112.0...v2.113.0</a> ## Resources - [Download release 2.113.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.113.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.113.0</a>). </pre>
	▼ v2.112.0	<pre> ## 2.112.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies. ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.111.0...v2.112.0">https://github.com/cloudfoundry/diego-release/compare/v2.111.0...v2.112.0</a> ## Resources - [Download release 2.112.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.112.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.112.0</a>). </pre>
	▼ v2.111.0	

Component	Version	Release Notes
		<pre> ## 2.111.0 **Release Date**: December 19, 2024 ## Changes - Bump envoy from 1.32.2 to 1.32.3. [Envoy v1.32.3] (<a href="https://github.com/envoyproxy/envoy/releases/tag/v1.32.3">https://github.com/envoyproxy/envoy/releases/tag/v1.32.3</a>) contains multiple CVE fixes. - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.110.0...v2.111.0">https://github.com/cloudfoundry/diego-release/compare/v2.110.0...v2.111.0</a> ## Resources - [Download release 2.111.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.111.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.111.0</a>). </pre>
	▼ v2.110.0	
		<pre> ## 2.110.0 **Release Date**: December 10, 2024 ## Changes - Dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.109.0...v2.110.0">https://github.com/cloudfoundry/diego-release/compare/v2.109.0...v2.110.0</a> ## Resources - [Download release 2.110.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.110.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.110.0</a>). </pre>
	▼ v2.109.0	
		<pre> ## 2.109.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.108.0...v2.109.0">https://github.com/cloudfoundry/diego-release/compare/v2.108.0...v2.109.0</a> ## Resources - [Download release 2.109.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.109.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.109.0</a>). </pre>
	▼ v2.108.0	
		<pre> ## 2.108.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 </pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- Bump dependancies</li> <li>## Built with go 1.23.4</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.107.0...v2.108.0">https://github.com/cloudfoundry/diego-release/compare/v2.107.0...v2.108.0</a></li> <li>## Resources</li> <li>- [Download release 2.108.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.108.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.108.0</a>)..</li> </ul> <p>▼ v2.107.0</p> <pre> ## 2.107.0 **Release Date**: November 20, 2024 ## Changes - Bump Go - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.106.0...v2.107.0">https://github.com/cloudfoundry/diego-release/compare/v2.106.0...v2.107.0</a> ## Resources - [Download release 2.107.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.107.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.107.0</a>).. </pre> <p>▼ v2.106.0</p> <pre> ## 2.106.0 **Release Date**: November 12, 2024 ## Changes - Various dependency bumps - Various doc and link fixes - Azure zone logs are now in json format with timestamps: <a href="https://github.com/cloudfoundry/diego-release/pull/958">https://github.com/cloudfoundry/diego-release/pull/958</a> ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.105.0...v2.106.0">https://github.com/cloudfoundry/diego-release/compare/v2.105.0...v2.106.0</a> ## Resources - [Download release 2.106.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.106.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.106.0</a>).. </pre>

Component	Version	Release Notes
garden-runc	1.71.0	<p>▼ v1.71.0</p> <pre> ## 1.71.0 **Release Date**: May 05, 2025 ## Changes - Fixed an issue with noble stemcells for memory calculation - [Bump iptables to libnftnl-1.2.9] (https://github.com/cloudfoundry/garden-runc-release/commit/5b59b3dd8d0b8bd25cc34773588e74f7c030b743) - [Bump libtool to debian/2.5.4-4] (https://github.com/cloudfoundry/garden-runc-release/commit/9d7382c9f3d3dc54a9e5b68fb307058d93acff84) ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.70.0...v1.71.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.70.0...v1.71.0</a> ## Resources - [Download release 1.71.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.71.0). </pre>
loggregator-agent	8.3.8	<p>▼ v8.3.8</p> <pre> ## What's Changed * Bump dependencies * Fix connection keep-alive time for https-batch syslog drains by @nicklas-dohrn in https://github.com/cloudfoundry/loggregator-agent-release/pull/699 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.7...v8.3.8">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.7...v8.3.8</a> </pre>
nfs-volume	7.27.0	<p>▼ v7.27.0</p> <pre> ## 7.27.0 **Release Date**: May 02, 2025 ## Changes - Dependency bumps ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.25.0...v7.27.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.25.0...v7.27.0</a> ## Resources - [Download release 7.27.0 from bosh.io] (https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.27.0). </pre>

Component	Version	Release Notes
otel-collector	0.11.4	

Component	Version	Release Notes
routing	0.337.0	<p>▼ v0.337.0</p> <pre> ## 0.337.0 **Release Date**: May 07, 2025 ## Changes - gorouter source code has been inlined directly into this release, and the separate repository has been archived. Thank you so much @maxmoehl!!! - Additional request timeout properties have been added to routing-release + gorouter to provide more flexibility with overall request timeouts. Previously `request_timeout_in_seconds` applied to both HTTP/1 and HTTP/2 requests. This limited the ability to guard against slowloris attacks for HTTP/1 requests while also allowing GRPC streams over HTTP/2 to live indefinitely. `request_timeout_in_seconds` is now used as a default value for the new `http_1_request_timeout_in_seconds` and `http_2_request_timeout_in_seconds` properties. See the property descriptions below for more information. Thanks @kart2bc! - Dependency updates ## Bosh Job Spec changes: ``diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index d373561e..a88b19ab 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -523,6 +523,16 @@ properties: Requests from router to backend endpoints that are longer than this duration will be canceled and logged as `backend-request-timeout` errors. If set to 0 this timeout is disabled. default: 900 + http_1_request_timeout_in_seconds: + description:   +   The amount of time HTTP/1 requests from the Gorouter to apps are allowed to live before being canceled. +   Enter value in seconds. Set to -1 to disable timeouts. If set to 0, it inherits the value from request_timeout_in_seconds. +   default: 0 + http_2_request_timeout_in_seconds: + description:   +   The amount of time HTTP/2 requests from the Gorouter to apps are allowed to live before being canceled. +   Enter value in seconds. Set to -1 to disable timeouts. If set to 0, it inherits the value from request_timeout_in_seconds. +   default: 0 endpoint_dial_timeout_in_seconds:</pre>

Component	Version	Release Notes
		<pre> description:     Maximum time in seconds for gorouter to establish a TCP connection with a backend. This timeout comes before `tls_handshake_timeout_in_seconds`.   ```  ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.336.0...v0.337.0">https://github.com/cloudfoundry/routing-release/compare/v0.336.0...v0.337.0</a> ## Resources - [Download release 0.337.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.337.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.337.0</a>). </pre>
		<p>▼ v0.336.0</p> <pre> ## 0.336.0 **Release Date**: April 28, 2025 ## Changes - haproxy bumped to v2.8.15 - When retrying retriable requests, Gorouter will now refresh the backend pool to detect backends that have been registered after the initial request was made. Thanks @mariash! ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.335.0...v0.336.0">https://github.com/cloudfoundry/routing-release/compare/v0.335.0...v0.336.0</a> ## Resources - [Download release 0.336.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.336.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.336.0</a>). </pre>
		<p>▼ v0.335.0</p> <pre> ## 0.335.0 **Release Date**: April 16, 2025 ## Changes - feat: introduce gorouter_time metrics - <a href="https://github.com/cloudfoundry/gorouter/pull/473">https://github.com/cloudfoundry/gorouter/pull/473</a> - Thanks @kart2bc - fix: add OU in client-cert field_map - <a href="https://github.com/cloudfoundry/routing-release/pull/464">https://github.com/cloudfoundry/routing-release/pull/464</a> - Thanks @plowin - dep: various dependency bumps and golang patch ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.334.0...v0.335.0">https://github.com/cloudfoundry/routing-release/compare/v0.334.0...v0.335.0</a> ## Resources - [Download release 0.335.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.335.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.335.0</a>). </pre>

Component	Version	Release Notes
		ry/routing-release?version=0.335.0).
silk	3.70.0	<p>▼ v3.70.0</p> <pre> ## 3.70.0 **Release Date**: May 09, 2025 ## Changes - Bump dependencies ## Built with go 1.24.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.69.0...v3.70.0">https://github.com/cloudfoundry/silk-release/compare/v3.69.0...v3.70.0</a> ## Resources - [Download release 3.70.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.70.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.70.0</a>). </pre>
smb-volume	3.25.0	<p>▼ v3.25.0</p> <pre> ## 3.25.0 **Release Date**: May 06, 2025 ## Changes - bump dependancies ## Built with go 1.24.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.24.0...v3.25.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.24.0...v3.25.0</a> ## Resources - [Download release 3.25.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.25.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.25.0</a>). </pre>
smoke-tests	4.10.0	
syslog	12.3.9	
tanzu-jammy-stack	1.0.1	

## 6.0.15

**Release Date:** 04/15/2025

- **[Feature]** There is a new “Enable container network traffic metrics for app instances” property in the “Networking” tab
- **[Feature Improvement]** Multiple enhancements to Application Security Group data syncing when using Dynamic ASGs at very high scale
- **[Breaking Change]** Gorouter now uses Go 1.24, because of this Gorouter’s limit on 1xx informational responses has changed. It previously aborted a request and returned an error after

receiving more than 5 1xx responses. It now returns an error if the total size of all 1xx responses exceeds 10MB.

- Bump bpm to version [1.4.17](#)
- Bump cf-networking to version [3.69.0](#)
- Bump cflinuxfs3 to version [0.623.0](#)
- Bump cflinuxfs4 to version [1.296.0](#)
- Bump cf-cli to version [2.0.0](#)
- Bump loggregator-agent to version [8.3.7](#)
- Bump nfs-volume to version [7.25.0](#)
- Bump otel-collector to version [0.11.4](#)
- Bump routing to version [0.334.0](#)
- Bump silk to version [3.69.0](#)
- Bump smb-volume to version [3.24.0](#)
- Bump syslog to version [12.3.9](#)

## Security Fixes

The following table lists CVEs that were fixed in each Isolation Segment component since the previous patch version of Isolation Segment:

Component	Vulnerabilities Resolved
cf-cli	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-v778-237x-gjrc</a> (critical)</li> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">GHSA-hcg3-q754-cr77</a> (high)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">GHSA-qxp5-gwg8-xv66</a> (medium)</li> </ul>
diego	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-fhg8-qxh5-7q3w</a> (critical)</li> </ul>
loggregator-agent	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>
otel-collector	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> <li>• <a href="#">CVE-2024-45341</a> (medium)</li> <li>• <a href="#">CVE-2024-45336</a> (medium)</li> <li>• <a href="#">CVE-2025-22871</a> (unknown)</li> </ul>
routing	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-mh63-6h87-95cp</a> (high)</li> </ul>
silk	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> </ul>

Component	Vulnerabilities Resolved
syslog	<ul style="list-style-type: none"><li>• <a href="#">CVE-2025-22866</a> (high)</li><li>• <a href="#">CVE-2025-22871</a> (unknown)</li></ul>

## Component Release Notes

Component	Version	Release Notes
ubuntu-jammy stemcell	1.803	
bpm	1.4.17	

Component	Version	Release Notes
cf-networking	3.69.0	<p>▼ v3.69.0</p> <pre> ## 3.69.0 **Release Date**: April 02, 2025 ## Changes - Testing fixes + additional logging for cf -networking-acceptance-tests ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.68.0...v3.69.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.68.0...v3.69.0</a> ## Resources - [Download release 3.69.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.69.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.69.0</a>).</pre> <p>▼ v3.68.0</p> <pre> ## 3.68.0 **Release Date**: March 24, 2025 ## Changes - Updated to golang 1.24.1 from 1.23.x - Adds support for an asg-data-last-change d endpoint on policy-server to optimize calls from vxlan-policy-agent - Adds better indexing of ASG data when ru nning the policy-server database on mysql-8.x or newer. ## Bosh Job Spec changes: ``` diff --git a/jobs/performance-test-sd/spec b/jobs/performance-test-sd/spec index fd83a044..b492caaa 100644 --- a/jobs/performance-test-sd/spec +++ b/jobs/performance-test-sd/spec @@ -6,7 +6,7 @@ templates: config.json.erb: config.json packages: - - golang-1.23-linux + - golang-1.24-linux - performance-test-sd consumes: ``` ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.67.0...v3.68.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.67.0...v3.68.0</a> ## Resources - [Download release 3.68.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.68.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.68.0</a>).</pre>
cflinuxfs3	0.623.0	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
cflinuxfs4	1.296.0	
cf-cli	2.0.0	<p>▼ v2.0.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>### Included CF CLI versions: 8.12.0</pre> </div>
count-cores-indicator	2.0.0	
diego	2.105.0	
garden-runc	1.70.0	
loggregator-agent	8.3.7	<p>▼ v8.3.7</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.6...v8.3.7">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.6...v8.3.7</a></pre> </div> <p>▼ v8.3.6</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## What's Changed * Bump packaged Go to go1.23.7 * Bump dependencies * Fix deadlock in https-batch syslog drains by @nicklas-dohrn in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/648">https://github.com/cloudfoundry/loggregator-agent-release/pull/648</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.5...v8.3.6">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.5...v8.3.6</a></pre> </div>

Component	Version	Release Notes
nfs-volume	7.25.0	<p>▼ v7.25.0</p> <pre>## 7.25.0 **Release Date**: March 24, 2025 ## Changes - Bump dependancies ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.24.0...v7.25.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.24.0...v7.25.0</a> ## Resources - [Download release 7.25.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.25.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.25.0</a>).</pre> <p>▼ v7.24.0</p> <pre>## 7.24.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.23.0...v7.24.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.23.0...v7.24.0</a> ## Resources - [Download release 7.24.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.24.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.24.0</a>).</pre>
otel-collector	0.11.4	<p>▼ v0.11.4</p> <pre>## What's Changed * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.3...v0.11.4">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.3...v0.11.4</a></pre> <p>▼ v0.11.3</p> <pre>## What's Changed * Bump packaged Golang to go1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.2...v0.11.3">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.2...v0.11.3</a></pre>

Component	Version	Release Notes
routing	0.334.0	<p>▼ v0.334.0</p> <pre> ## 0.334.0 **Release Date**: March 31, 2025 ## Changes - feat: Introduce switch for envelope v1 metrics - <a href="https://github.com/cloudfoundry/router-release/pull/456">https://github.com/cloudfoundry/router-release/pull/456</a> - Thanks @bltamara and @mike-jc ! - revert fix for race condition now that race condition does not exist - <a href="https://github.com/cloudfoundry/gorouter/pull/469">https://github.com/cloudfoundry/gorouter/pull/469</a> - This change + Go 1.24 changes how 1XX responses are handled. This might affect users: [Transport] (<a href="https://tip.golang.org/pkg/net/http#Transport">https://tip.golang.org/pkg/net/http#Transport</a>)'s limit on 1xx informational responses received in response to a request has changed. It previously aborted a request and returned an error after receiving more than 5 1xx responses. It now returns an error if the total size of all 1xx responses exceeds the [Transport.MaxResponseHeaderBytes] (<a href="https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes">https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes</a>) configuration setting. ## Bosh Job Spec changes: ``` diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 1feb42f7..d373561e 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -76,8 +76,14 @@ properties: description: "TLS Certificate used for the TLS listener of the LB healthcheck endpoint" router.status.tls.key: description: "Private Key used for the TLS listener of the LB healthcheck endpoint" + router.enable_envelope_v1_metrics: +   description: "Enables support for metrics reported via Envelope." +   default: true router.prometheus.port: -   description: "Port for the prometheus endpoint." +   description: "Port for the prometheus endpoint. Automatically enables Prometheus support." + router.prometheus.enable_scraper: +   description: "Activate the Prometheus scraper to collect metrics from the gorouter." +   default: true router.prometheus.server_name: description: "The server name used in the certificate for the metrics endpoint." router.prometheus.ca_cert: @@ -89,6 +95,18 @@ properties: </pre>

Component	Version	Release Notes
		<pre> router.prometheus.key:   description: "TLS private key for prometheus server."   default: ""   +  router.prometheus.meters.route_lookup_time_histogram_buckets:     +  description: "Upper limits in nanoseconds of the ranges in which the observed value of route lookup time is expected to fall"     +  default: [10000, 20000, 30000, 40000, 50000, 60000, 70000, 80000, 90000, 100000]     +  router.prometheus.meters.route_registration_latency_histogram_buckets:       +  description: "Upper limits in milliseconds of the ranges in which the observed value of route registration latency is expected to fall"       +  default: [0.1, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4]       +  router.prometheus.meters.routing_response_latency_histogram_buckets:         +  description: "Upper limits in milliseconds of the ranges in which the observed value of route response latency is expected to fall"         +  default: [1, 2, 4, 6, 8, 10, 20, 40, 50, 100, 500, 1000]         +  router.prometheus.meters.http_latency_histogram_buckets:           +  description: "Upper limits in seconds of the ranges in which the observed value of the latency of http requests from gorouter and back"           +  default: [0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, 12.8, 25.6]           router.requested_route_registration_interval_in_seconds:             description:                 On startup, the router will delay listening for requests by this duration to increase likelihood that it has a complete routing table before serving requests.             ``             ## Built with go 1.24.1             **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.333.0...v0.334.0">https://github.com/cloudfoundry/routing-release/compare/v0.333.0...v0.334.0</a>             ## Resources             - [Download release 0.334.0 from <a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.334.0">bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.334.0). </a></pre> <p>▼ v0.333.0</p> <pre> ## 0.333.0 **Release Date**: March 24, 2025 ## Changes </pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- Upgrade go to 1.24!</li> <li>- △ Minor Go bumps often cause some turbulence with routing-release. You can read the full go 1.24 release [notes here] (<a href="https://tip.golang.org/doc/go1.24">https://tip.golang.org/doc/go1.24</a>).</li> <li>- △ Go 1.24 changes how 1XX responses are handled. This might affect users: <ul style="list-style-type: none"> <li>&gt; [Transport] (<a href="https://tip.golang.org/pkg/net/http#Transport">https://tip.golang.org/pkg/net/http#Transport</a>)'s limit on 1xx informational responses received in response to a request has changed. It previously aborted a request and returned an error after receiving more than 5 1xx responses. It now returns an error if the total size of all 1xx responses exceeds the [Transport.MaxResponseHeaderBytes] (<a href="https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes">https://tip.golang.org/pkg/net/http#Transport.MaxResponseHeaderBytes</a>) configuration setting.</li> </ul> </li> <li>## Bosh Job Spec changes:</li> <pre>```diff diff --git a/jobs/acceptance_tests/spec b/jobs/acceptance_tests/spec index 51a81762..109e7e3f 100644 --- a/jobs/acceptance_tests/spec +++ b/jobs/acceptance_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.23-linux + - golang-1.24-linux - acceptance_tests - rtr - cf-cli-8-linux diff --git a/jobs/smoke_tests/spec b/jobs/smoke_tests/spec index 4ea8eb07..1260ab4f 100644 --- a/jobs/smoke_tests/spec +++ b/jobs/smoke_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.23-linux + - golang-1.24-linux - acceptance_tests - cf-cli-8-linux ``` </pre> <li>## Built with go 1.24.1</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.332.0...v0.333.0">https://github.com/cloudfoundry/routing-release/compare/v0.332.0...v0.333.0</a></li> <li>## Resources</li> <li>- [Download release 0.333.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.333.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.333.0</a>).</li> </ul>

Component	Version	Release Notes
silk	3.69.0	<p>▼ v3.69.0</p> <pre> ## 3.69.0 **Release Date**: April 02, 2025 ## Changes - Adds the ability to configure the HTTP client-side timeout used when vxlan-policy-agent is talking to policy-server for ASG + C2C network policy information. - Updates the default HTTP client-side timeout from 5s, to 30s. ## Bosh Job Spec changes: ``diff diff --git a/jobs/vxlan-policy-agent/spec b/jobs/vxlan-policy-agent/spec index 802f04bb..430009c6 100644 --- a/jobs/vxlan-policy-agent/spec +++ b/jobs/vxlan-policy-agent/spec @@ -52,6 +52,10 @@ properties: description: "The VXLAN policy agent queries the policy server on this interval in seconds and updates local policy rules." default: 5 + client_timeout_seconds: + description: "Timeout to use for HTTP connections to policy_server" + default: 30 + enable_asg_syncing: description: "Enable dynamic updates to ASG rules for running containers" default: true ``` ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.68.0...v3.69.0">https://github.com/cloudfoundry/silk-release/compare/v3.68.0...v3.69.0</a> ## Resources - [Download release 3.69.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.69.0). </pre> <p>▼ v3.68.0</p> <pre> ## 3.68.0 **Release Date**: March 24, 2025 ## Changes - Bump to golang 1.24.1 from 1.23.x - vxlan-policy-agent now only syncs ASG data if it has changed since the last polling interval. ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.67.0...v3.68.0">https://github.com/cloudfoundry/silk-release/compare/v3.67.0...v3.68.0</a> ## Resources </pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- [Download release 3.68.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.68.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.68.0</a>).</li> </ul> <p>▼ v3.67.0</p> <pre>## 3.67.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.66.0...v3.67.0">https://github.com/cloudfoundry/silk-release/compare/v3.66.0...v3.67.0</a> ## Resources - [Download release 3.67.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.67.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.67.0</a>).</pre>
smb-volume	3.24.0	<p>▼ v3.24.0</p> <pre>## 3.24.0 **Release Date**: March 24, 2025 ## Changes - Bump dependancies ## Built with go 1.24.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.23.0...v3.24.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.23.0...v3.24.0</a> ## Resources - [Download release 3.24.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.24.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.24.0</a>).</pre> <p>▼ v3.23.0</p> <pre>## 3.23.0 **Release Date**: March 21, 2025 ## Changes - dependency bumps ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.22.0...v3.23.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.22.0...v3.23.0</a> ## Resources - [Download release 3.23.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.23.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.23.0</a>).</pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
syslog	12.3.9	<p>▼ v12.3.9</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Golang to go1.23.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.8...v12.3.9">https://github.com/cloudfoundry/syslog-release/compare/v12.3.8...v12.3.9</a></pre> <p>▼ v12.3.8</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Golang to go1.23.7 ## New Contributors * @schmidtsv made their first contribution in <a href="https://github.com/cloudfoundry/syslog-release/pull/207">https://github.com/cloudfoundry/syslog-release/pull/207</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.7...v12.3.8">https://github.com/cloudfoundry/syslog-release/compare/v12.3.7...v12.3.8</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.14

**Release Date:** 03/25/2025

**[Feature]** Gorouter respects new `X-CF-PROCESS-INSTANCE` header for routing to specific app processes, especially helpful for testing canary deployments. See [these docs](#) for more information.

- Bump cf-networking to version [3.67.0](#)
- Bump cflinuxfs3 to version [0.620.0](#)
- Bump cflinuxfs4 to version [1.291.0](#)
- Bump routing to version [0.332.0](#)

### Security Fixes

The following table lists CVEs that were fixed in each Isolation Segment component since the previous patch version of Isolation Segment:

Component	Vulnerabilities Resolved
cf-networking	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a> (high)</li> </ul>

### Component Release Notes

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
ubuntu-jammy stemcell	1.785	
bpm	1.4.16	
cf-networking	3.67.0	<p>▼ v3.67.0</p> <pre>## 3.67.0 **Release Date**: March 20, 2025 ## Changes - Bump dependancies - Use capi v3 endpoints. Thanks https://github.com/cloudfoundry/cf-networking-release/pull/316 @winkingturtle-vmw ## Built with go 1.23.7 **Full Changelog**: https://github.com/cloudfoundry/cf-networking-release/compare/v3.66.0...v3.67.0 ## Resources - [Download release 3.67.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.67.0).</pre>
cflinuxfs3	0.620.0	
cflinuxfs4	1.291.0	
cf-cli	1.68.0	
count-cores-indicator	2.0.0	
diego	2.105.0	
garden-runc	1.70.0	
loggregator-agent	8.3.5	
nfs-volume	7.23.0	
otel-collector	0.11.2	

Component	Version	Release Notes
routing	0.332.0	<p>▼ v0.332.0</p> <pre> ## 0.332.0 **Release Date**: March 20, 2025 ## Changes - In-line submodules - <a href="https://github.com/cloudfoundry/routing-release/pull/457">https://github.com/cloudfoundry/routing-release/pull/457</a> - thank you @maxmoehl ! - move timing info to extra access log fields logic - <a href="https://github.com/cloudfoundry/routing-release/pull/455">https://github.com/cloudfoundry/routing-release/pull/455</a> - thank you @maxmoehl ! - Add routing via X-CF-PROCESS-INSTANCE - <a href="https://github.com/cloudfoundry/gorouter/pull/467">https://github.com/cloudfoundry/gorouter/pull/467</a> - Thanks @ameowlia ! ## Bosh Job Spec changes: ``diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 9d694a02..1feb42f7 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -328,7 +328,7 @@ properties: this property and operators have to explicitly enable them. This is done to prevent breaking log parsing in existing setups by the introduction of new fields. Does not affect stdout / stderr logs. - Available fields are: local_address + Available fields are: backend_time, dial_time, dns_time, failed_attempts, failed_attempts_time, local_address, tls_time default: [] router.logging.format.timestamp: description:   ``` ## Built with go 1.23.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.331.0...v0.332.0">https://github.com/cloudfoundry/routing-release/compare/v0.331.0...v0.332.0</a> ## Resources - [Download release 0.332.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.332.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.332.0</a>). </pre>
silk	3.66.0	
smb-volume	3.22.0	
smoke-tests	4.10.0	
syslog	12.3.7	

Component	Version	Release Notes
tanzu-jammy-stack	1.0.1	

## 6.0.13

**Release Date:** 03/11/2025

- **[Feature Improvement]** Operators can now let Puma auto-configure the number of workers based on the number of available cores.
- **[Feature Improvement]:** Backport GA OpenTelemetry Collector
- **[Bug Fix]** SMB Broker now supports all the mount parameters that the SMB Driver does ('sec', 'dir\_mode', 'file\_mode' were missing)
- Bump bpm to version [1.4.16](#)
- Bump cf-networking to version [3.66.0](#)
- Bump cflinuxfs3 to version [0.618.0](#)
- Bump cflinuxfs4 to version [1.288.0](#)
- Bump garden-runc to version [1.70.0](#)
- Bump loggregator-agent to version [8.3.5](#)
- Bump nfs-volume to version [7.23.0](#)
- Bump routing to version [0.331.0](#)
- Bump silk to version [3.66.0](#)
- Bump smb-volume to version [3.22.0](#)
- Bump syslog to version [12.3.7](#)

### Security Fixes

The following table lists CVEs that were fixed in each Isolation Segment component since the previous patch version of Isolation Segment:

Component	Vulnerabilities Resolved
bpm	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> </ul>
cf-networking	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>
smb-volume	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>

<b>Component</b>	<b>Vulnerabilities Resolved</b>
silk	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>
garden-runc	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2025-22866</a></li> </ul>
cflinuxfs4	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>
loggregator-agent	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>
nfs-volume	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-13176</a></li> <li>• <a href="#">CVE-2024-12797</a></li> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>
syslog	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2024-45341</a></li> </ul>
mapfs	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-w32m-9786-jp63</a></li> <li>• <a href="#">CVE-2024-45336</a></li> <li>• <a href="#">CVE-2025-22866</a></li> <li>• <a href="#">GHSA-p782-xgp4-8hr8</a></li> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">GHSA-v778-237x-gjrc</a></li> </ul>

## Component Release Notes

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
ubuntu-jammy stemcell	1.775	
bpm	1.4.16	

Component	Version	Release Notes
cf-networking	3.66.0	<p>▼ v3.66.0</p> <pre> ## 3.66.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.65.0...v3.66.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.65.0...v3.66.0</a> ## Resources - [Download release 3.66.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.66.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.66.0</a>). </pre> <p>▼ v3.65.0</p> <pre> ## 3.65.0 **Release Date**: January 31, 2025 ## Changes - Bump dependancies - Update iptables-writter to work with multi-cidr overlay networks, which are now available in silk-release 3.65.0. [See here for more info on this effort. ](<a href="https://github.com/cloudfoundry/silk-release/pull/148">https://github.com/cloudfoundry/silk-release/pull/148</a>) ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.64.0...v3.65.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.64.0...v3.65.0</a> ## Resources - [Download release 3.65.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.65.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.65.0</a>). </pre> <p>▼ v3.64.0</p> <pre> ## 3.64.0 **Release Date**: January 21, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.63.0...v3.64.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.63.0...v3.64.0</a> ## Resources - [Download release 3.64.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.64.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.64.0</a>). </pre>
cflinuxfs3	0.618.0	

Component	Version	Release Notes
cflinuxfs4	1.288.0	
cf-cli	1.68.0	
count-cores-indicator	2.0.0	
diego	2.105.0	

Component	Version	Release Notes
garden-runc	1.70.0	<p>▼ v1.70.0</p> <pre> ## 1.70.0 **Release Date**: February 05, 2025 ## Changes - Upgrade containerd to V2 (<a href="https://github.com/cloudfoundry/garden-runc-release/pull/368">https://github.com/cloudfoundry/garden-runc-release/pull/368</a>, <a href="https://github.com/cloudfoundry/guardian/pull/466">https://github.com/cloudfoundry/guardian/pull/466</a>, <a href="https://github.com/cloudfoundry/wga-app-platform-runtime-ci/pull/61">https://github.com/cloudfoundry/wga-app-platform-runtime-ci/pull/61</a>) - Various dependency bumps ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.69.0...v1.70.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.69.0...v1.70.0</a>. ## Resources - [Download release 1.70.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.70.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.70.0</a>).</pre> <p>▼ v1.69.0</p> <pre> ## 1.69.0 **Release Date**: February 03, 2025 ## Changes - bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.68.0...v1.69.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.68.0...v1.69.0</a>. ## Resources - [Download release 1.69.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.69.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.69.0</a>).</pre> <p>▼ v1.68.0</p> <pre> ## 1.68.0 **Release Date**: January 22, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.67.0...v1.68.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.67.0...v1.68.0</a>. ## Resources - [Download release 1.68.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.68.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.68.0</a>).</pre>

Component	Version	Release Notes
loggregator-agent	8.3.5	<p>▼ v8.3.5</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.4...v8.3.5">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.4...v8.3.5</a></pre></div> <p>▼ v8.3.4</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.3...v8.3.4">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.3...v8.3.4</a></pre></div>

Component	Version	Release Notes
nfs-volume	7.23.0	<p>▼ v7.23.0</p> <pre> ## 7.23.0 **Release Date**: March 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.22.0...v7.23.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.22.0...v7.23.0</a> ## Resources - [Download release 7.23.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.23.0). </pre>
		<p>▼ v7.22.0</p> <pre> ## 7.22.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.21.0...v7.22.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.21.0...v7.22.0</a> ## Resources - [Download release 7.22.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.22.0). </pre>
		<p>▼ v7.21.0</p> <pre> ## 7.21.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.20.0...v7.21.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.20.0...v7.21.0</a> ## Resources - [Download release 7.21.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.21.0). </pre>
		<p>▼ v7.20.0</p> <pre> ## 7.20.0 **Release Date**: February 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.19.0...v7.20.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.19.0...v7.20.0</a> ## Resources - [Download release 7.20.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.20.0). </pre>

Component	Version	Release Notes
		<pre>dfoundry/nfs-volume-release/compare/v7.19.0...v7.20.0 ## Resources - [Download release 7.20.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.20.0).</pre> <p>▼ v7.19.0</p> <pre>## 7.19.0 **Release Date**: January 31, 2025 ## Changes - Fix map-fs-fuse packaging script to avoid collision with binaries installed on compilation-vms in case of re-using compilation vms. ## Built with go 1.23.5 **Full Changelog**: https://github.com/cloudfoundry/nfs-volume-release/compare/v7.18.0...v7.19.0 ## Resources - [Download release 7.19.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.19.0).</pre> <p>▼ v7.18.0</p> <pre>## 7.18.0 **Release Date**: January 27, 2025 ## Changes - Move code base from mapfs-release into nfs-volume-release - Add map-fs-performance-acceptance-tests errand ## Bosh Job Spec changes: ``` diff --git a/jobs/dockerdriver-integration/spec b/jobs/dockerdriver-integration/spec index 51e78351..02a908e9 100644 --- a/jobs/dockerdriver-integration/spec +++ b/jobs/dockerdriver-integration/spec @@ -9,6 +9,7 @@ templates: packages: - dockerdriver-integration - nfs-debs +- map-fs - nfsv3driver @@ -19,4 +20,4 @@ properties: mapfs_path: description: "Path to mapfs binary" - default: /var/vcap/packages/mapfs/bin/mapfs + default: /var/vcap/packages/map-fs/bin/mapfs diff --git a/jobs/map-fs-performance-acceptance-tests/spec b/jobs/map-fs-performance-acceptance-tests/spec ``` </pre>

Component	Version	Release Notes
		<pre> eptance-tests/spec   new file mode 100644   index 00000000..a3f30383   --- /dev/null   +++ b/jobs/map-fs-performance-acceptance-te sts/spec @@ -0,0 +1,23 @@ +--- +name: map-fs-performance-acceptance-tests + +templates: +  pre-start.erb: bin/pre-start +  run.erb: bin/run +  config.json.erb: config/config.json + +packages: +- map-fs-performance-acceptance-tests +- map-fs +- map-fs-fuse +- nfs-debs + + +properties: +  nfs_remote_path: +    description: Address for SMB Remote Pa th +    default: nfstestserver.service.cf.inte rnal:export + +  mapfs_path: +    description: "Path to mapfs binary" +    default: /var/vcap/packages/map-fs/bi n/mapfs diff --git a/jobs/nfsv3driver/spec b/jobs/n fsv3driver/spec index fc9fe47b..7d5262d8 100644 --- a/jobs/nfsv3driver/spec +++ b/jobs/nfsv3driver/spec @@ -17,10 +17,8 @@ templates: packages: - nfs-debs - nfsv3driver - -consumes: -- name: mapfs - type: mapfs +- map-fs +- map-fs-fuse properties: nfsv3driver.statd_port: ``` ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/clou dfoundry/nfs-volume-release/compare/v7.17.0...v7.18.0">https://github.com/clou dfoundry/nfs-volume-release/compare/v7.17.0...v7.18.0</a> ## Resources - [Download release 7.18.0 from bosh.io](ht </pre>

Component	Version	Release Notes
		<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.18.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.18.0</a> .
otel-collector	0.11.2	

Component	Version	Release Notes
routing	0.331.0	<p>▼ v0.331.0</p> <pre> ## 0.331.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies - Inline multierror submodule - https://github.com/cloudfoundry/routing-release/pull/454 - Thanks @maxmoehl ! ## Built with go 1.23.6 **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.330.0...v0.331.0 ## Resources - [Download release 0.331.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.331.0). </pre> <p>▼ v0.330.0</p> <pre> ## 0.330.0 **Release Date**: February 07, 2025 ## Changes - bump dependancies - add extendable bosh property to log extra access log fields - https://github.com/cloudfoundry/routing-release/pull/448 - thanks @maxmoehl ! ## Bosh Job Spec changes: ``` diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 868629ac..9d694a02 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -322,6 +322,14 @@ properties:     router.logging.syslog_network:       description: "Network protocol to use when connecting to the syslog server. Valid values are 'tcp', 'udp', . When choosing an empty string value, the local syslog daemon is used."       default: "udp"       + router.logging.extra_access_log_fields:         + description:             + An array of additional access log fields to log. Any new log fields will only be exposed via             + this property and operators have to explicitly enable them. This is done to prevent breaking               + log parsing in existing setups by the introduction of new fields. Does not affect stdout /                 + stderr logs.                 + Available fields are: local_address                 + default: [] ``` </pre>

Component	Version	Release Notes
		<pre>router.logging.format.timestamp:   description:       Format for timestamp in component logs. Valid values are 'rfc3339', 'deprecated', and 'unix-epoch'.   ```    ## Built with go 1.23.6   **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.329.0...v0.330.0">https://github.com/cloudfoundry/routing-release/compare/v0.329.0...v0.330.0</a>   ## Resources   - [Download release 0.330.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.330.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.330.0</a>).</pre>

Component	Version	Release Notes
silk	3.66.0	<p>▼ v3.66.0</p> <pre> ## 3.66.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.65.0...v3.66.0">https://github.com/cloudfoundry/silk-release/compare/v3.65.0...v3.66.0</a> ## Resources - [Download release 3.66.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.66.0). </pre> <p>▼ v3.65.0</p> <pre> ## 3.65.0 **Release Date**: January 31, 2025 ## Changes - Bump dependancies - New feature: the overlay network (as defined in the silk-controller job as the "network" property) can now be an array of CIDR addresses instead of just one CIDR address. For backwards compatibility reasons providing a string of one CIDR is still an allowed format. [See here for more info on this effort. ](https://github.com/cloudfoundry/silk-release/pull/148) Thanks @ameowlia ! ## Bosh Job Spec changes: ```diff diff --git a/jobs/silk-cni/spec b/jobs/silk-cni/spec index 670763da..75936752 100644 --- a/jobs/silk-cni/spec +++ b/jobs/silk-cni/spec @@ -10,8 +10,6 @@ packages: - silk-cni consumes: -- name: cf_network - type: cf_network - name: vpa type: policy-agent @@ -31,7 +29,10 @@ provides: properties: no_masquerade_cidr_range: - description: "CIDR address block that should not be masqueraded. Fallback to cf_network.network link property if property is not provided." + description:   + When set, app traffic sent to this CIDR will not be masqueraded. If this + property is not set, then silk-cni will not masquerade traffic sent to the </pre>

Component	Version	Release Notes
		<pre> +           overlay network, which allows container-to-container networking to work. default: "" mtu: diff --git a/jobs/silk-controller/spec b/jobs/silk-controller/spec index cc7529a8..cb66a1e8 100644 --- a/jobs/silk-controller/spec +++ b/jobs/silk-controller/spec @@ -29,8 +29,12 @@ provides: properties: network: -   description: "CIDR address block for overlay network. Subnets for each diego cell are allocated out of this network." -   default: "10.255.0.0/16" +   description:   +     A single CIDR address block as a string, or an array of CIDR address +     blocks for overlay network as an array of strings. Subnets for each diego +     cell are allocated out of this network. The "subnet_prefix_length" +     property must be smaller than the smallest CIDR address block. +   default: ["10.255.0.0/16"] subnet_prefix_length: description: "Length, in bits, of the prefix for subnets allocated per Diego cell, e.g. '24' for a '/24' subnet." diff --git a/jobs/silk-daemon/spec b/jobs/silk-daemon/spec index e3786357..572b08c9 100644 --- a/jobs/silk-daemon/spec +++ b/jobs/silk-daemon/spec @@ -88,7 +88,13 @@ properties: default: false single_ip_only: -   description: "When true, this VM will get assigned exactly one IP address on the Silk network. Use this to connect this VM to the Silk network without acquiring a whole block of addresses (as would be required for a Diego Cell)." +   description:   +     When true, this VM will get assigned exactly one IP address on the Silk +     network. Use this to connect this VM to the Silk network without +     acquiring a whole block of addresses (as would be required for a Diego +     Cell). WARNING: Do not use single_ip_only mode when the overlay network has +     more than one CIDR. The overlay network is set on the silk-controller +     job via the "network" bosh property. </pre>

Component	Version	Release Notes
		<pre>default: false policy_server_url: ``` ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.64.0...v3.65.0">https://github.com/cloudfoundry/silk-release/compare/v3.64.0...v3.65.0</a> ## Resources - [Download release 3.65.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.65.0).  ▼ v3.64.0  ## 3.64.0 **Release Date**: January 21, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.63.0...v3.64.0">https://github.com/cloudfoundry/silk-release/compare/v3.63.0...v3.64.0</a> ## Resources - [Download release 3.64.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.64.0).</pre>

Component	Version	Release Notes
smb-volume	3.22.0	<p>▼ v3.22.0</p> <pre> ## 3.22.0 **Release Date**: March 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.21.0...v3.22.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.21.0...v3.22.0</a> ## Resources - [Download release 3.22.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.22.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.22.0</a>). </pre> <p>▼ v3.21.0</p> <pre> ## 3.21.0 **Release Date**: February 28, 2025 ## Changes - Bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.20.0...v3.21.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.20.0...v3.21.0</a> ## Resources - [Download release 3.21.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.21.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.21.0</a>). </pre> <p>▼ v3.20.0</p> <pre> ## 3.20.0 **Release Date**: February 18, 2025 ## Changes - bump dependancies ## Built with go 1.23.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.19.0...v3.20.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.19.0...v3.20.0</a> ## Resources - [Download release 3.20.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.20.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.20.0</a>). </pre> <p>▼ v3.19.0</p> <pre> ## 3.19.0 **Release Date**: February 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.18.0...v3.19.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.18.0...v3.19.0</a> ## Resources - [Download release 3.19.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.19.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.19.0</a>). </pre>

Component	Version	Release Notes
		<pre>dfoundry/smb-volume-release/compare/v3.18.0...v3.19.0 ## Resources - [Download release 3.19.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.19.0).  ▼ v3.18.0  ## 3.18.0 **Release Date**: January 30, 2025 ## Changes - Fixes a bug where smb broker didn't allow the same mount options that smb driver allowed (was missing `sec`, `dir_mode`, and `file_mode`) - Dependency bumps ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.17.0...v3.18.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.17.0...v3.18.0</a> ## Resources - [Download release 3.18.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.18.0).  ▼ v3.17.0  ## 3.17.0 **Release Date**: January 22, 2025 ## Changes - Bump to go 1.23.5 - Bump dependancies ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.16.0...v3.17.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.16.0...v3.17.0</a> ## Resources - [Download release 3.17.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.17.0).</pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
syslog	12.3.7	<p>▼ v12.3.7</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.6...v12.3.7">https://github.com/cloudfoundry/syslog-release/compare/v12.3.6...v12.3.7</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.12

**Release Date:** 02/03/2025

- **[Feature Improvement]** Add optional, experimental pprof extension to OTel Collector
- Bump bpm to version [1.4.11](#)
- Bump cf-networking to version [3.63.0](#)
- Bump cflinuxfs3 to version [0.592.0](#)
- Bump cflinuxfs4 to version [1.274.0](#)
- Bump garden-runc to version [1.67.0](#)
- Bump loggregator-agent to version [8.3.3](#)
- Bump mapfs to version [1.17.0](#)
- Bump nfs-volume to version [7.17.0](#)
- Bump otel-collector to version [0.11.2](#)
- Bump routing to version [0.329.0](#)
- Bump silk to version [3.63.0](#)
- Bump smb-volume to version [3.16.0](#)
- Bump syslog to version [12.3.6](#)

### Security Fixes

The following table lists CVEs that were fixed in each Isolation Segment component since the previous patch version of Isolation Segment:

Component	Vulnerabilities Resolved
garden-runc	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2024-45336</a></li> </ul>

Component	Vulnerabilities Resolved
bpm	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2024-45341</a></li> <li>• <a href="#">CVE-2024-45336</a></li> </ul>
loggregator-agent	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> </ul>
otel-collector	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> <li>• <a href="#">GHSA-xr7q-jx4m-x55m</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-mh55-gqvf-xfwm</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> </ul>
syslog	<ul style="list-style-type: none"> <li>• <a href="#">GHSA-4v7x-pqxf-cx7m</a></li> <li>• <a href="#">GHSA-36jr-mh4h-2g58</a></li> <li>• <a href="#">GHSA-45x7-px36-x8w8</a></li> </ul>

## Component Release Notes

Component	Version	Release Notes
ubuntu-jammy stemcell	1.719	
bpm	1.4.11	

Component	Version	Release Notes
cf-networking	3.63.0	<p>▼ v3.63.0</p> <pre>## 3.63.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.62.0...v3.63.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.62.0...v3.63.0</a> ## Resources - [Download release 3.63.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.63.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.63.0</a>).</pre> <p>▼ v3.62.0</p> <pre>## 3.62.0 **Release Date**: December 21, 2024 ## Changes - Bump go mod dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.61.0...v3.62.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.61.0...v3.62.0</a> ## Resources - [Download release 3.62.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.62.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.62.0</a>).</pre> <p>▼ v3.61.0</p> <pre>## 3.61.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.60.0...v3.61.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.60.0...v3.61.0</a> ## Resources - [Download release 3.61.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.61.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.61.0</a>).</pre>
cflinuxfs3	0.592.0	
cflinuxfs4	1.274.0	
cf-cli	1.68.0	
count-cores-indicator	2.0.0	

Component	Version	Release Notes
diego	2.105.0	
garden-runc	1.67.0	<p>▼ v1.67.0</p> <pre>## 1.67.0 **Release Date**: January 17, 2025 ## Changes - Add support for cgroups v2 <a href="https://github.com/cloudfoundry/guardian/pull/465">https://github.com/cloudfoundry/guardian/pull/465</a> ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.66.0...v1.67.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.66.0...v1.67.0</a> ## Resources - [Download release 1.67.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.67.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.67.0</a>).</pre>
		<p>▼ v1.66.0</p> <pre>## 1.66.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.65.0...v1.66.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.65.0...v1.66.0</a> ## Resources - [Download release 1.66.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.66.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.66.0</a>).</pre>
		<p>▼ v1.65.0</p> <pre>## 1.65.0 **Release Date**: December 20, 2024 ## Changes - Fix path for functions #367 - Various dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.64.0...v1.65.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.64.0...v1.65.0</a> ## Resources - [Download release 1.65.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.65.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.65.0</a>).</pre>

Component	Version	Release Notes
loggregator-agent	8.3.3	<p>▼ v8.3.3</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.2...v8.3.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.2...v8.3.3</a></pre></div>

Component	Version	Release Notes
mapfs	1.17.0	<p>▼ v1.17.0</p> <pre> ## 1.17.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.16.0...v1.17.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.16.0...v1.17.0</a> ## Resources - [Download release 1.17.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.17.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.17.0</a>). </pre>
		<p>▼ v1.16.0</p>
		<pre> ## 1.16.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.15.0...v1.16.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.15.0...v1.16.0</a> ## Resources - [Download release 1.16.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.16.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.16.0</a>). </pre>
		<p>▼ v1.15.0</p>
		<pre> ## 1.15.0 **Release Date**: December 20, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.14.0...v1.15.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.14.0...v1.15.0</a> ## Resources - [Download release 1.15.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.15.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.15.0</a>). </pre>
		<p>▼ v1.14.0</p>
		<pre> ## 1.14.0 **Release Date**: December 17, 2024 ## Changes * [Bump] (<a href="https://github.com/cloudfoundry/mapfs-release/commit/782c0f7f2e877f175d5796708af02ecd67bc7065">https://github.com/cloudfoundry/mapfs-release/commit/782c0f7f2e877f175d5796708af02ecd67bc7065</a>) <a href="https://github.com/mesonbuild">https://github.com/mesonbuild</a> </pre>

Component	Version	Release Notes
		<pre>d/meson/releases/tag/1.6.1 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.13.0...v1.14.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.13.0...v1.14.0</a> ## Resources - [Download release 1.14.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.14.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.14.0</a>).  ▼ v1.13.0  ## 1.13.0 **Release Date**: December 16, 2024 ## Changes - Update dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.12.0...v1.13.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.12.0...v1.13.0</a> ## Resources - [Download release 1.13.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.13.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.13.0</a>).</pre>

Component	Version	Release Notes
nfs-volume	7.17.0	<p>▼ v7.17.0</p> <pre>## 7.17.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.16.0...v7.17.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.16.0...v7.17.0</a>. ## Resources - [Download release 7.17.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.17.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.17.0</a>).</pre>
		<p>▼ v7.16.0</p> <pre>## 7.16.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.15.0...v7.16.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.15.0...v7.16.0</a>. ## Resources - [Download release 7.16.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.16.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.16.0</a>).</pre>
		<p>▼ v7.15.0</p> <pre>## 7.15.0 **Release Date**: December 20, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.14.0...v7.15.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.14.0...v7.15.0</a>. ## Resources - [Download release 7.15.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.15.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.15.0</a>).</pre>
		<p>▼ v7.14.0</p> <pre>## 7.14.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.13.0...v7.14.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.13.0...v7.14.0</a>.</pre>

Component	Version	Release Notes
		<pre>dfoundry/nfs-volume-release/compare/v7.13.0...v7.14.0 ## Resources - [Download release 7.14.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.14.0).</pre>

Component	Version	Release Notes
otel-collector	0.11.2	<p>▼ v0.11.2</p> <pre>## What's Changed * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.1...v0.11.2">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.1...v0.11.2</a></pre> <p>▼ v0.11.1</p> <pre>## What's Changed * Correctly interpolate `secret` properties when the `name` includes a hyphen by @acostal1 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/58">https://github.com/cloudfoundry/otel-collector-release/pull/58</a> * Load string values in `allow_list` properties by @ctlong in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/59">https://github.com/cloudfoundry/otel-collector-release/pull/59</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.1</a></pre> <p>▼ v0.11.0</p> <pre>## What's Changed * Bump packaged Golang to go1.22.8 * Bump OTel Collector components to v0.11.0 by @mkocher in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/56">https://github.com/cloudfoundry/otel-collector-release/pull/56</a> * `otlp` exporter now has batching built in * Internal metrics are now emitted with names prefixed with `otelcol_` * Change `allow_list` properties by @acosta11 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/57">https://github.com/cloudfoundry/otel-collector-release/pull/57</a> * Unspecified or `nil` still equates to "allow all" * An empty array now equates to "allow nothing" instead of "allow all" * Add `pprof` extension by @acosta11 in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/57">https://github.com/cloudfoundry/otel-collector-release/pull/57</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.11.0...v0.11.0</a></pre>

Component	Version	Release Notes
routing	0.329.0	<p>▼ v0.329.0</p> <pre> ## 0.329.0 **Release Date**: January 21, 2025 ## Changes - **BREAKING CHANGE**: The `lb_algo` load balancing option key name has been renamed to `loadbalancing`. This standardizes the name across components. Read more about this change [here] (<a href="https://github.com/cloudfoundry/community/pull/1039">https://github.com/cloudfoundry/community/pull/1039</a>). - Bump to go 1.23.5. - Bump dependancies. ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index b9afabbe..c39eac91 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -144,7 +144,7 @@ properties:     writable (optional, boolean): sets the writable flag. defaults to false     options object     - lb_algo (optional, string): Load balancing algorithm for routing incoming requests to the backend: 'round-robin' or 'least-connection'. In cases where this option is not specified, the algorithm defined in gorouter spec is applied.     + loadbalancing (optional, string): Load balancing algorithm for routing incoming requests to the backend: 'round-robin' or 'least-connection'. In cases where this option is not specified, the algorithm defined in gorouter spec is applied.     example:       - name: my-service @@ -162,7 +162,7 @@ properties:     timeout: 5s     route_service_url: https://my-oauth-proxy-route-service.example.com     options:     - lb_algo: least-connection     + loadbalancing: least-connection     - name: my-tls-endpoint     tls_port: 12346     server_cert_domain_san: "my-tls-endpoint.internal.com" ``` ## Built with go 1.23.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.328.0...v0.329.0">https://github.com/cloudfoundry/routing-release/compare/v0.328.0...v0.329.0</a> ## Resources - [Download release 0.329.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfound">https://bosh.io/releases/github.com/cloudfound</a></pre>

Component	Version	Release Notes
		<p>ry/routing-release?version=0.329.0).</p> <p>▼ v0.328.0</p> <pre> ## 0.328.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.327.0...v0.328.0">https://github.com/cloudfoundry/routing-release/compare/v0.327.0...v0.328.0</a> ## Resources - [Download release 0.328.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.328.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.328.0</a>). </pre> <p>▼ v0.327.0</p> <pre> ## 0.327.0 **Release Date**: December 20, 2024 ## Changes - Bug fix: update the tcp_routes table to have host_tls_port default to 0 instead of NUL. Before this fix, tcp routes registered via external-to-cf route registrars running routing-release 0.301.0 or lower will have intermittent connectivity issues. - <a href="https://github.com/cloudfoundry/routing-api/pull/67">https://github.com/cloudfoundry/routing-api/pull/67</a> - Thanks @ameowlia! - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.326.0...v0.327.0">https://github.com/cloudfoundry/routing-release/compare/v0.326.0...v0.327.0</a> ## Resources - [Download release 0.327.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.327.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.327.0</a>). </pre> <p>▼ v0.326.0</p> <pre> ## 0.326.0 **Release Date**: December 16, 2024 ## Changes - **Breaking Change:** Gorouter will now properly emit [RFC5424] (<a href="https://datatracker.ietf.org/doc/html/rfc5424">https://datatracker.ietf.org/doc/html/rfc5424</a>) syslog messages instead of broken BSD-style syslog messages. It now only supports syslog over UDP and TCP like it is documented for some time now - [gorouter #459] (<a href="https://github.com/cloudfoundry/gorouter/pull/459">https://github.com/cloudfoundry/gorouter/pull/459</a>) &amp; [gorouter #411] (<a href="https://github.com/cloudfoundry/gorouter/pull/411">https://github.com/cloudfoundry/gorouter/pull/411</a>) - Tha </pre>

Component	Version	Release Notes
		<pre> nks @maxmoehl and @peanball ! - Gorouter now supports configurable syslog message truncation via gorouter's new router. logging.syslog_message_limit bosh property [g orouter #447] (<a href="https://github.com/cloudfoundry/routing-release/pull/447">https://github.com/cloudfoundry/routing-release/pull/447</a>) - Thanks @maxmoeh l ! - Bump tcp-router's haproxy to 2.8.13 - Bump dependencies ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/goro uter/spec index cdebbd5a..868629ac 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -313,6 +313,9 @@ properties: router.logging.syslog_tag: description: "Tag to use when writing syslo g messages" default: "vcap.gorouter" + router.logging.syslog_message_limit: + description: "Limit the number of byte s per access log written to syslog. A value o f zero disables the limit." + default: 0 router.logging.syslog_addr: description: "Address of a syslog server to send access logs" default: "localhost:514" ``` ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.325.0...v0.326.0">https://github.com/cloudfoundry/routing-release/compare/v0.325.0...v0.326.0</a> ## Resources - [Download release 0.326.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.326.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.326.0</a>). </pre>

Component	Version	Release Notes
silk	3.63.0	<p>▼ v3.63.0</p> <pre>## 3.63.0 **Release Date**: January 06, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.62.0...v3.63.0">https://github.com/cloudfoundry/silk-release/compare/v3.62.0...v3.63.0</a> ## Resources - [Download release 3.63.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.63.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.63.0</a>).</pre> <p>▼ v3.62.0</p> <pre>## 3.62.0 **Release Date**: December 21, 2024 ## Changes - Bump go mod dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.61.0...v3.62.0">https://github.com/cloudfoundry/silk-release/compare/v3.61.0...v3.62.0</a> ## Resources - [Download release 3.62.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.62.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.62.0</a>).</pre> <p>▼ v3.61.0</p> <pre>## 3.61.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.60.0...v3.61.0">https://github.com/cloudfoundry/silk-release/compare/v3.60.0...v3.61.0</a> ## Resources - [Download release 3.61.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.61.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.61.0</a>).</pre>

Component	Version	Release Notes
smb-volume	3.16.0	<p>▼ v3.16.0</p> <pre>## 3.16.0 **Release Date**: January 03, 2025 ## Changes - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.15.0...v3.16.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.15.0...v3.16.0</a> ## Resources - [Download release 3.16.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.16.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.16.0</a>).</pre> <p>▼ v3.15.0</p> <pre>## 3.15.0 **Release Date**: December 20, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.14.0...v3.15.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.14.0...v3.15.0</a> ## Resources - [Download release 3.15.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.15.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.15.0</a>).</pre> <p>▼ v3.14.0</p> <pre>## 3.14.0 **Release Date**: December 16, 2024 ## Changes - Bump dependencies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.13.0...v3.14.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.13.0...v3.14.0</a> ## Resources - [Download release 3.14.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.14.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.14.0</a>).</pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
syslog	12.3.6	<p>▼ v12.3.6</p> <pre>## What's Changed * Bump blackbox dependencies * Bump packaged Go to go1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.5...v12.3.6">https://github.com/cloudfoundry/syslog-release/compare/v12.3.5...v12.3.6</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.11

**Release Date:** 01/09/2025

- Bump bpm to version [1.4.6](#)
- Bump cf-networking to version [3.60.0](#)
- Bump cf-cli to version [1.68.0](#)
- Bump garden-runc to version [1.64.0](#)
- Bump loggregator-agent to version [8.3.2](#)
- Bump mapfs to version [1.12.0](#)
- Bump nfs-volume to version [7.13.0](#)
- Bump routing to version [0.325.0](#)
- Bump silk to version [3.60.0](#)
- Bump smb-volume to version [3.13.0](#)
- Bump syslog to version [12.3.5](#)

### Security Fixes

The following table lists CVEs that were fixed in each Isolation Segment component since the previous patch version of Isolation Segment:

Component	Vulnerabilities Resolved
nfs-volume	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>

Component	Vulnerabilities Resolved
smoke-tests	<ul style="list-style-type: none"> <li>• CVE-2023-48795</li> <li>• CVE-2024-26146</li> <li>• CVE-2024-25126</li> <li>• CVE-2022-29526</li> <li>• CVE-2024-26141</li> <li>• CVE-2024-21510</li> <li>• CVE-2024-47220</li> </ul>
diego	<ul style="list-style-type: none"> <li>• CVE-2024-51744</li> <li>• CVE-2022-29526</li> </ul>
tanzu-jammy-stack	<ul style="list-style-type: none"> <li>• CVE-2023-48795</li> <li>• CVE-2023-3978</li> <li>• CVE-2022-29526</li> <li>• CVE-2022-41723</li> </ul>
smb-volume	<ul style="list-style-type: none"> <li>• CVE-2022-29526</li> </ul>
syslog	<ul style="list-style-type: none"> <li>• CVE-2023-45288</li> <li>• CVE-2023-48795</li> <li>• CVE-2022-29526</li> </ul>
cflinuxfs3	<ul style="list-style-type: none"> <li>• CVE-2018-13347</li> <li>• CVE-2018-16395</li> <li>• CVE-2024-27280</li> <li>• CVE-2023-26112</li> <li>• CVE-2020-14343</li> <li>• CVE-2021-41817</li> <li>• CVE-2019-3902</li> <li>• CVE-2018-13348</li> <li>• CVE-2017-18342</li> <li>• CVE-2022-29526</li> <li>• CVE-2018-13346</li> <li>• CVE-2024-47220</li> <li>• CVE-2020-10663</li> <li>• CVE-2020-25613</li> <li>• CVE-2018-17983</li> <li>• CVE-2020-8130</li> <li>• CVE-2021-31799</li> </ul>

<b>Component</b>	<b>Vulnerabilities Resolved</b>
loggregator-agent	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
silk	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
cflinuxfs4	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
mapfs	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
otel-collector	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2023-45288</a></li> <li>• <a href="#">CVE-2023-48795</a></li> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
bpm	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
garden-runc	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
routing	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>
cf-networking	<ul style="list-style-type: none"> <li>• <a href="#">CVE-2022-29526</a></li> </ul>

## Component Release Notes

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
ubuntu-jammy stemcell	1.651	
bpm	1.4.6	

Component	Version	Release Notes
cf-networking	3.60.0	<p>▼ v3.60.0</p> <pre>## 3.60.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.59.0...v3.60.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.59.0...v3.60.0</a> ## Resources - [Download release 3.60.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.60.0).</pre>
		<p>▼ v3.59.0</p> <pre>## 3.59.0 **Release Date**: December 04, 2024 ## Changes - Upgrade cf-networking-healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.58.0...v3.59.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.58.0...v3.59.0</a> ## Resources - [Download release 3.59.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.59.0).</pre>
		<p>▼ v3.58.0</p> <pre>## 3.58.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.57.0...v3.58.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.57.0...v3.58.0</a> ## Resources - [Download release 3.58.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.58.0).</pre>
		<p>▼ v3.57.0</p> <pre>## 3.57.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps - Updated unit/integration/cf-networking-ac</pre>

Component	Version	Release Notes
		<p>ceptance testing output to be less verbose on happy paths. Thanks @davewalter!</p> <pre>## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.56.0...v3.57.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.56.0...v3.57.0</a> ## Resources - [Download release 3.57.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.57.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.57.0</a>).</pre>
	▼ v3.56.0	<pre>## 3.56.0 **Release Date**: November 18, 2024 ## Changes - Upgrade cf-networking-healthchecker - Bump Go - Add Extra Response Headers handler to proxy example app - <a href="https://github.com/cloudfoundry/cf-networking-release/pull/310">https://github.com/cloudfoundry/cf-networking-release/pull/310</a> - Thanks @ameowlia ! - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.55.0...v3.56.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.55.0...v3.56.0</a> ## Resources - [Download release 3.56.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.56.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.56.0</a>).</pre>
	▼ v3.55.0	<pre>## 3.55.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.54.0...v3.55.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.54.0...v3.55.0</a> ## Resources - [Download release 3.55.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.55.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.55.0</a>).</pre>
	▼ v3.54.0	<pre>## 3.54.0 **Release Date**: November 05, 2024 ## Changes - [Convert PortAllocator's ints to uint32 to avoid int overflows when picking ports](<a href="https://github.com/cloudfoundry/cf-networking-release/commit/0000000000000000000000000000000000000000">https://github.com/cloudfoundry/cf-networking-release/commit/0000000000000000000000000000000000000000</a>)</pre>

Component	Version	Release Notes
		<pre>ps://github.com/cloudfoundry/cf-networking-release/commit/7d4c9490695f1cab72341d13300b15c0b35707bf) ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.53.0...v3.54.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.53.0...v3.54.0</a> ## Resources - [Download release 3.54.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.54.0).</pre> <p>▼ v3.53.0</p> <pre>## 3.53.0 **Release Date**: October 22, 2024 ## Changes - Bump dependancies - Use Server struct to address gossec G114 - <a href="https://github.com/cloudfoundry/cf-networking-release/pull/305">https://github.com/cloudfoundry/cf-networking-release/pull/305</a> Thanks @andy-a-d-nguyen! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.52.0...v3.53.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.52.0...v3.53.0</a> ## Resources - [Download release 3.53.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.53.0).</pre>
cflinuxfs3	0.417.0	
cflinuxfs4	1.130.0	
cf-cli	1.68.0	<p>▼ v1.68.0</p> <pre>### Included CF CLI versions: 7.7.15 8.8.3</pre>
count-cores-indicator	2.0.0	
diego	2.105.0	

Component	Version	Release Notes
garden-runc	1.64.0	<p>▼ v1.64.0</p> <pre> ## 1.64.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump dependancies ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.63.0...v1.64.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.63.0...v1.64.0</a> ## Resources - [Download release 1.64.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.64.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.64.0</a>). </pre>
		<p>▼ v1.63.0</p> <pre> ## 1.63.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.62.0...v1.63.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.62.0...v1.63.0</a> ## Resources - [Download release 1.63.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.63.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.63.0</a>). </pre>
		<p>▼ v1.62.0</p> <pre> ## 1.62.0 **Release Date**: November 18, 2024 ## Changes - Bump golang ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.61.0...v1.62.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.61.0...v1.62.0</a> ## Resources - [Download release 1.62.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.62.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.62.0</a>). </pre>
		<p>▼ v1.61.0</p> <pre> ## 1.61.0 **Release Date**: November 14, 2024 ## Changes - Bump iptables to 1.8.11 ## Built with go 1.23.2 </pre>

Component	Version	Release Notes
		<pre>**Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.60.0...v1.61.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.60.0...v1.61.0</a> ## Resources - [Download release 1.61.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.61.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.61.0</a>).</pre>
		<p>▼ v1.60.0</p> <pre>## 1.60.0 **Release Date**: November 07, 2024 ## Changes - G115 fixes - Pin runc to 1.1.14 ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.59.0...v1.60.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.59.0...v1.60.0</a> ## Resources - [Download release 1.60.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.60.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.60.0</a>).</pre>
		<p>▼ v1.59.0</p> <pre>## 1.59.0 **Release Date**: October 30, 2024 ## Changes - Update dependencies ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.58.0...v1.59.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.58.0...v1.59.0</a> ## Resources - [Download release 1.59.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.59.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.59.0</a>).</pre>
		<p>▼ v1.58.0</p> <pre>## 1.58.0 **Release Date**: October 24, 2024 ## Changes - Bump dependancies ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.57.0...v1.58.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.57.0...v1.58.0</a> ## Resources - [Download release 1.58.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.58.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.58.0</a>).</pre>

Component	Version	Release Notes
		y/garden-runc-release?version=1.58.0).
loggregator-agent	8.3.2	<p>▼ v8.3.2</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.22.10 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.1...v8.3.2">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.1...v8.3.2</a></pre> <p>▼ v8.3.1</p> <pre>## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.0...v8.3.1">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.3.0...v8.3.1</a></pre>

Component	Version	Release Notes
mapfs	1.12.0	<p>▼ v1.12.0</p> <pre> ## 1.12.0 **Release Date**: December 09, 2024 ## Changes - Dependency updates ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.11.0...v1.12.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.11.0...v1.12.0</a> ## Resources - [Download release 1.12.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.12.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.12.0</a>). </pre> <p>▼ v1.11.0</p> <pre> ## 1.11.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.10.0...v1.11.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.10.0...v1.11.0</a> ## Resources - [Download release 1.11.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.11.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.11.0</a>). </pre> <p>▼ v1.10.0</p> <pre> ## 1.10.0 **Release Date**: December 02, 2024 ## Changes - Dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.9.0...v1.10.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.9.0...v1.10.0</a> ## Resources - [Download release 1.10.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.10.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.10.0</a>). </pre> <p>▼ v1.9.0</p> <pre> ## 1.9.0 **Release Date**: November 27, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.8.0...v1.9.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.8.0...v1.9.0</a> </pre>

Component	Version	Release Notes
		<pre>dfoundry/mapfs-release/compare/v1.8.0...v1.9.0 ## Resources - [Download release 1.9.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.9.0).</pre>
	▼ v1.8.0	<pre>## 1.8.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.7.0...v1.8.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.7.0...v1.8.0</a> ## Resources - [Download release 1.8.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.8.0).</pre>
	▼ v1.7.0	<pre>## 1.7.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. - Validate against integer overflows in mapfs's Chown() call - <a href="https://github.com/cloudfoundry/mapfs-release/pull/283">https://github.com/cloudfoundry/mapfs-release/pull/283</a> - Thanks @geofffranks ! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.6.0...v1.7.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.6.0...v1.7.0</a> ## Resources - [Download release 1.7.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.7.0).</pre>
	▼ v1.6.0	<pre>## 1.6.0 **Release Date**: October 31, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.5.0...v1.6.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.5.0...v1.6.0</a> ## Resources - [Download release 1.6.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.6.0).</pre>

Component	Version	Release Notes
		<p>y/mapfs-release?version=1.6.0).</p> <p>▼ v1.5.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 1.5.0 **Release Date**: October 24, 2024 ## Changes - Bump dependancies ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.4.0...v1.5.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.4.0...v1.5.0</a> ## Resources - [Download release 1.5.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.5.0).</pre></div>

Component	Version	Release Notes
nfs-volume	7.13.0	<p>▼ v7.13.0</p> <pre>## 7.13.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.12.0...v7.13.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.12.0...v7.13.0</a> ## Resources - [Download release 7.13.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.13.0).</pre>
		<p>▼ v7.12.0</p> <pre>## 7.12.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4. ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.11.0...v7.12.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.11.0...v7.12.0</a> ## Resources - [Download release 7.12.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.12.0).</pre>
		<p>▼ v7.11.0</p> <pre>## 7.11.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps - OpenLDAP bumped to 2.6.9 ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.10.0...v7.11.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.10.0...v7.11.0</a> ## Resources - [Download release 7.11.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.11.0).</pre>
		<p>▼ v7.10.0</p> <pre>## 7.10.0 **Release Date**: November 27, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.3</pre>

Component	Version	Release Notes
		<pre> **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.9.0...v7.10.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.9.0...v7.10.0</a> ## Resources - [Download release 7.10.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.10.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.10.0</a>).  ▼ v7.9.0  ## 7.9.0 **Release Date**: November 18, 2024 ## Changes - Restart rpc group as asked by in man page - - <a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1044">https://github.com/cloudfoundry/nfs-volume-release/pull/1044</a> - Thank you @krsna-m ! - Bump go - Bump dependancies ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.8.0...v7.9.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.8.0...v7.9.0</a> ## Resources - [Download release 7.9.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.9.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.9.0</a>). </pre>
otel-collector	0.10.1	

Component	Version	Release Notes
routing	0.325.0	<p>▼ v0.325.0</p> <pre> ## 0.325.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.324.0...v0.325.0">https://github.com/cloudfoundry/routing-release/compare/v0.324.0...v0.325.0</a> ## Resources - [Download release 0.325.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.325.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.325.0</a>). </pre>
		<p>▼ v0.324.0</p> <pre> ## 0.324.0 **Release Date**: December 05, 2024 ## Changes - [Upgrade routing-healthchecker] (<a href="https://github.com/cloudfoundry/routing-release/commit/d429341973f55be5f69e57176ee9c971fb2cf375">https://github.com/cloudfoundry/routing-release/commit/d429341973f55be5f69e57176ee9c971fb2cf375</a>) - [Upgrade golang-1.23-linux (1.23.4)] (<a href="https://github.com/cloudfoundry/routing-release/commit/8fb1521593bb8aa9881aa3206c42a5a1bfefbfd1">https://github.com/cloudfoundry/routing-release/commit/8fb1521593bb8aa9881aa3206c42a5a1bfefbfd1</a>) ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.323.0...v0.324.0">https://github.com/cloudfoundry/routing-release/compare/v0.323.0...v0.324.0</a> ## Resources - [Download release 0.324.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.324.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.324.0</a>). </pre>
		<p>▼ v0.323.0</p> <pre> ## 0.323.0 **Release Date**: December 02, 2024 ## Changes - Dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.322.0...v0.323.0">https://github.com/cloudfoundry/routing-release/compare/v0.322.0...v0.323.0</a> ## Resources - [Download release 0.323.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.323.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.323.0</a>). </pre>
		<p>▼ v0.322.0</p>

Component	Version	Release Notes
		<pre> ## 0.322.0 **Release Date**: November 27, 2024 ## Changes - Various minor dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.321.0...v0.322.0">https://github.com/cloudfoundry/routing-release/compare/v0.321.0...v0.322.0</a> ## Resources - [Download release 0.322.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.322.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.322.0</a>). </pre> <p>▼ v0.321.0</p> <pre> ## 0.321.0 **Release Date**: November 18, 2024 ## Changes - Add bosh properties for additional header (request and response) limits - <a href="https://github.com/cloudfoundry/routing-release/issues/309">https://github.com/cloudfoundry/routing-release/issues/309</a>, <a href="https://github.com/cloudfoundry/routing-release/pull/443">https://github.com/cloudfoundry/routing-release/pull/443</a>, <a href="https://github.com/cloudfoundry/gorouter/pull/453">https://github.com/cloudfoundry/gorouter/pull/453</a> - Thanks @maxmoehl ! - Bump Go - Bump dependancies ## Bosh Job Spec changes: ``` diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index c7896a27..cdebbd5a 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -266,12 +266,41 @@ properties:  description: "Enforce strict validation of a route service signature"  default: false  router.max_header_kb: +    description:   +        Deprecated, use router.max_request_header_kb instead which is equivalent to this option. +    default: 1024 # 1Mb +    router.max_request_header_kb:  description:    This value controls the maximum number of bytes (in KB) the gorouter will read  parsing the request header's keys and values, including the request  line. It does not limit the size of the request body. Requests with  larger headers will result in a 431 status code. Must be between 1 and 1024kb. -    default: 1024 # 1Mb +    Note: This value takes precedence over router.max_header_kb but has no default </pre>

Component	Version	Release Notes
		<pre> to not break +           existing setups. If you previously configured router.max_header_kb it is recomme nded to +           switch to this property instead. +           example: 1024 # 1Mb +           router.max_response_header_kb: +           description:   +               This value controls the maximum nu mber of bytes (in KB) the gorouter will read +               parsing the response header's keys and values, including the request +               line. It does not limit the size o f the response body. Responses with +               larger headers will result in a 50 2 status code. A limit of zero or less will +               result in the default GoLang limit being used. +           default: 0 +           router.max_request_headers: +           description:   +               This value controls the maximum nu mber of headers gorouter will accept in a +               single request. Only the header ke ys are counted and values separated by commas +               are not considered additional head ers. Setting this to zero or less disables th e +               limit. Must be at least 30 for CF to function properly (enforced). +           default: 0 +           router.max_response_headers: +           description:   +               This value controls the maximum nu mber of headers gorouter will accept in a +               single response. Only the header k eys are counted and values separated by comma s +               are not considered additional head ers. Setting this to zero or less disables th e +               limit. Must be at least 30 for CF to function properly (enforced). +           default: 0 +           router.extra_headers_to_log: description: "An array of headers that acce ss log events will be annotated with. This on ly applies to headers on requests." default: [] ``` ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.320.0...v0.321.0">https://github.com/cloudfoundry/routing-release/compare/v0.320.0...v0.321.0</a> ## Resources - [Download release 0.321.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfound">https://bosh.io/releases/github.com/cloudfound</a></pre>

Component	Version	Release Notes
		<p>ry/routing-release?version=0.321.0).</p> <p>▼ v0.320.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 0.320.0 **Release Date**: November 15, 2024 ## Changes - Upgrade routing-healthchecker ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.319.0...v0.320.0">https://github.com/cloudfoundry/routing-release/compare/v0.319.0...v0.320.0</a> ## Resources - [Download release 0.320.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.320.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.320.0</a>).</pre></div>

Component	Version	Release Notes
silk	3.60.0	<p>▼ v3.60.0</p> <pre> ## 3.60.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.59.0...v3.60.0">https://github.com/cloudfoundry/silk-release/compare/v3.59.0...v3.60.0</a> ## Resources - [Download release 3.60.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.60.0). </pre>
		<p>▼ v3.59.0</p> <pre> ## 3.59.0 **Release Date**: December 04, 2024 ## Changes - Upgrade silk-healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.58.0...v3.59.0">https://github.com/cloudfoundry/silk-release/compare/v3.58.0...v3.59.0</a> ## Resources - [Download release 3.59.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.59.0). </pre>
		<p>▼ v3.58.0</p> <pre> ## 3.58.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 - Bump healthchecker ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.57.0...v3.58.0">https://github.com/cloudfoundry/silk-release/compare/v3.57.0...v3.58.0</a> ## Resources - [Download release 3.58.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.58.0). </pre>
		<p>▼ v3.57.0</p> <pre> ## 3.57.0 **Release Date**: December 02, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.3 </pre>

Component	Version	Release Notes
		<p>**Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.56.0...v3.57.0">https://github.com/cloudfoundry/silk-release/compare/v3.56.0...v3.57.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"> <li>- [Download release 3.57.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.57.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.57.0</a>).</li> </ul>
		<p>▼ v3.56.0</p> <p>## 3.56.0</p> <p>**Release Date**: November 18, 2024</p> <p>## Changes</p> <ul style="list-style-type: none"> <li>- [Upgrade silk-healthchecker] (<a href="https://github.com/cloudfoundry/silk-release/commit/9a64b05ce674243a2b738d0253407661a03b1159">https://github.com/cloudfoundry/silk-release/commit/9a64b05ce674243a2b738d0253407661a03b1159</a>)</li> <li>- Bump Go</li> <li>- Bump dependancies</li> <li>## Built with go 1.23.3</li> </ul> <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.55.0...v3.56.0">https://github.com/cloudfoundry/silk-release/compare/v3.55.0...v3.56.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"> <li>- [Download release 3.56.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.56.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.56.0</a>).</li> </ul>
		<p>▼ v3.55.0</p> <p>## 3.55.0</p> <p>**Release Date**: November 14, 2024</p> <p>## Changes</p> <ul style="list-style-type: none"> <li>- Dependency bumps</li> <li>## Built with go 1.23.2</li> </ul> <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.54.0...v3.55.0">https://github.com/cloudfoundry/silk-release/compare/v3.54.0...v3.55.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"> <li>- [Download release 3.55.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.55.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.55.0</a>).</li> </ul>
		<p>▼ v3.54.0</p> <p>## 3.54.0</p> <p>**Release Date**: November 05, 2024</p> <p>## Changes</p> <ul style="list-style-type: none"> <li>- [Address integer overflows when downcasting for G115] (<a href="https://github.com/cloudfoundry/silk-release/commit/58a8d27d505cc0cc8f69ed91a35d9cbbc8cc9c46">https://github.com/cloudfoundry/silk-release/commit/58a8d27d505cc0cc8f69ed91a35d9cbbc8cc9c46</a>)</li> <li>- [Address integer overflows when downcasting for G115] (<a href="https://github.com/cloudfoundry/silk-release/pull/145">https://github.com/cloudfoundry/silk-release/pull/145</a>)</li> </ul>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- [add retry logic for LinkList and AddrList netlink calls in cni] (<a href="https://github.com/cloudfoundry/silk-release/commit/2f280324816cef03771099b1a34552d35d4cb55e">https://github.com/cloudfoundry/silk-release/commit/2f280324816cef03771099b1a34552d35d4cb55e</a>)</li> <li>- [Retry with backoff tests] (<a href="https://github.com/cloudfoundry/silk-release/commit/f0ebfc864d0588f39765c9c38e30aacb1dce7588">https://github.com/cloudfoundry/silk-release/commit/f0ebfc864d0588f39765c9c38e30aacb1dce7588</a>)</li> <li>- [Add retry logic for LinkList and AddrList netlink calls in cni #147] (<a href="https://github.com/cloudfoundry/silk-release/pull/147">https://github.com/cloudfoundry/silk-release/pull/147</a>)</li> </ul> <p>## Built with go 1.23.2</p> <p>**Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.53.0...v3.54.0">https://github.com/cloudfoundry/silk-release/compare/v3.53.0...v3.54.0</a></p> <p>## Resources</p> <ul style="list-style-type: none"> <li>- [Download release 3.54.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.54.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.54.0</a>) .</li> </ul> <p>▼ v3.53.0</p> <pre> ## 3.53.0 **Release Date**: October 22, 2024 ## Changes - Bump dependancies ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.52.0...v3.53.0">https://github.com/cloudfoundry/silk-release/compare/v3.52.0...v3.53.0</a> ## Resources - [Download release 3.53.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.53.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.53.0</a>) . </pre>

Component	Version	Release Notes
smb-volume	3.13.0	<p>▼ v3.13.0</p> <pre> ## 3.13.0 **Release Date**: December 09, 2024 ## Changes - Dependency Bumps ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.12.0...v3.13.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.12.0...v3.13.0</a> ## Resources - [Download release 3.13.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.13.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.13.0</a>). </pre> <p>▼ v3.12.0</p> <pre> ## 3.12.0 **Release Date**: December 04, 2024 ## Changes - Bump go to 1.23.4 ## Built with go 1.23.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.11.0...v3.12.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.11.0...v3.12.0</a> ## Resources - [Download release 3.12.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.12.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.12.0</a>). </pre> <p>▼ v3.11.0</p> <pre> ## 3.11.0 **Release Date**: December 02, 2024 ## Changes - Dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.10.0...v3.11.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.10.0...v3.11.0</a> ## Resources - [Download release 3.11.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.11.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.11.0</a>). </pre> <p>▼ v3.10.0</p> <pre> ## 3.10.0 **Release Date**: November 27, 2024 ## Changes - Minor dependency bumps ## Built with go 1.23.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.9.0...v3.10.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.9.0...v3.10.0</a> </pre>

Component	Version	Release Notes
		<pre>dfoundry/smb-volume-release/compare/v3.9.0... v3.10.0 ## Resources - [Download release 3.10.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.10.0).</pre>
smoke-tests	4.10.0	
syslog	12.3.5	<p>▼ v12.3.5</p> <pre>## What's Changed * Bump dependencies * bump packaged Golang to go1.22.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.4...v12.3.5">https://github.com/cloudfoundry/syslog-release/compare/v12.3.4...v12.3.5</a></pre> <p>▼ v12.3.4</p> <pre>## What's Changed * Fix syslog_storer write permissions in Noble stemcells with new apparmor rules by @ramonskie in <a href="https://github.com/cloudfoundry/syslog-release/pull/188">https://github.com/cloudfoundry/syslog-release/pull/188</a> * Bump packaged Golang to go1.22.8 * Bump blackbox dependencies ## New Contributors * @ramonskie made their first contribution in <a href="https://github.com/cloudfoundry/syslog-release/pull/188">https://github.com/cloudfoundry/syslog-release/pull/188</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.3...v12.3.4">https://github.com/cloudfoundry/syslog-release/compare/v12.3.3...v12.3.4</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.10

**Release Date:** 11/19/2024

**[Bug Fix]** Gorouter now properly calculates header sizes when limiting “Maximum request header size” on HTTP requests.

- Bump cf-networking to version [3.52.0](#)
- Bump cflinuxfs3 to version [0.417.0](#)
- Bump loggregator-agent to version [8.3.0](#)
- Bump nfs-volume to version [7.8.0](#)
- Bump routing to version [0.319.0](#)

- Bump silk to version 3.52.0
- Bump smb-volume to version 3.9.0

Component	Version	Release Notes
ubuntu-jammy stemcell	1.639	
bpm	1.4.0	
cf-networking	3.52.0	<p>▼ v3.52.0</p> <pre> ## 3.52.0 **Release Date**: October 03, 2024 ## Changes - [Bump the example-apps to Golang 1.23 ()](https://github.com/cloudfoundry/cf-networking-release/commit/0a4815b48b911c4ef3201bb1faa9c097c99f3e74) https://github.com/cloudfoundry/cf-networking-release/pull/303[]] (https://github.com/cloudfoundry/cf-networking-release/commit/0a4815b48b911c4ef3201bb1faa9c097c99f3e74) - [Upgrade cf-networking-healthchecker](https://github.com/cloudfoundry/cf-networking-release/commit/6b0bf9b821719b2097608117e1760f3a3e4cda93) ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/cf-networking-release/compare/v3.51.0...v3.52.0 ## Resources - [Download release 3.52.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.52.0). </pre>
cflinuxfs3	0.417.0	
cflinuxfs4	1.130.0	
cf-cli	1.67.0	
count-cores-indicator	2.0.0	
diego	2.105.0	
garden-runc	1.57.0	

Component	Version	Release Notes
loggregator-agent	8.3.0	<p>▼ v8.3.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Add `https-batch` protocol to loggr-syslog-agent for more efficient (batched) https drains by @nicklas-dohrn in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/491">https://github.com/cloudfoundry/loggregator-agent-release/pull/491</a> * Bump dependencies * Bump packaged Golang to go1.22.8 ## New Contributors * @nicklas-dohrn made their first contribution in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/491">https://github.com/cloudfoundry/loggregator-agent-release/pull/491</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.1...v8.3.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.1...v8.3.0</a></pre></div>
mapfs	1.4.0	

Component	Version	Release Notes
nfs-volume	7.8.0	<p>▼ v7.8.0</p> <pre>## 7.8.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.7.0...v7.8.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.7.0...v7.8.0</a> ## Resources - [Download release 7.8.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.8.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.8.0</a>).</pre>
		<p>▼ v7.7.0</p> <pre>## 7.7.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. - Ensure uid/guids are parsed for uint32 compatibility before downcasting - <a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1043">https://github.com/cloudfoundry/nfs-volume-release/pull/1043</a> - Thanks @geofffranks ! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.6.0...v7.7.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.6.0...v7.7.0</a> ## Resources - [Download release 7.7.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.7.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.7.0</a>).</pre>
		<p>▼ v7.6.0</p> <pre>## 7.6.0 **Release Date**: October 31, 2024 ## Changes - Fix bbr metadata.sh.erb - <a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1042">https://github.com/cloudfoundry/nfs-volume-release/pull/1042</a> - Thanks @jochenehret! - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.5.0...v7.6.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.5.0...v7.6.0</a> ## Resources - [Download release 7.6.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.6.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.6.0</a>).</pre>
		<p>▼ v7.5.0</p>

Component	Version	Release Notes
		<pre>## 7.5.0 **Release Date**: October 18, 2024 ## Changes - Bump to golang 1.23.2 - Now requires 3 consecutive failures to connect to rpcbind + statd ports before monit restarting the services, to avoid problems with ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.4.0...v7.5.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.4.0...v7.5.0</a> ## Resources - [Download release 7.5.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.5.0).</pre>
otel-collector	0.10.1	

Component	Version	Release Notes
routing	0.319.0	<p>▼ v0.319.0</p> <pre> ## 0.319.0 **Release Date**: November 14, 2024 ## Changes - Bumps haproxy to 2.8.12 ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.318.0...v0.319.0">https://github.com/cloudfoundry/routing-release/compare/v0.318.0...v0.319.0</a> ## Resources - [Download release 0.319.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.319.0). </pre> <p>▼ v0.318.0</p> <pre> ## 0.318.0 **Release Date**: November 05, 2024 ## Changes - Enhance Gorouter retry logic - <a href="https://github.com/cloudfoundry/gorouter/issues/437">https://github.com/cloudfoundry/gorouter/issues/437</a> - Thanks @bltamara! - Update Routing-API and route registrar for tcp routes - <a href="https://github.com/cloudfoundry/routing-release/commit/80cab2aafbbbe30c9fd01458d9ac5452fe0457f1">https://github.com/cloudfoundry/routing-release/commit/80cab2aafbbbe30c9fd01458d9ac5452fe0457f1</a> - Thanks @geofffranks! - Convert all port handling logic to uint16 - Thanks @geofffranks ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index 4f887265..b9afabbe 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -71,16 +71,13 @@ properties:    description: "Log level for route_registrar"      default: "info"    route_registrar.routing_api.api_url:      - description: (optional, string) The routing API's URL. This is required to register any TCP routes.        - default: https://routing-api.service.cf.internal:3001          + description: (optional, string) The routing API's URL. This is required to register any TCP routes. If not provided here or via link, this defaults to 'https://routing-api.service.cf.internal:3001'    route_registrar.routing_api.oauth_url:      - description: (optional, string) The OAuth server's URL. This is required to register any TCP routes.        - default: https://uaa.service.cf.intern ``` </pre>

Component	Version	Release Notes
		<pre> al:8443 +   description: (optional, string) The OAuth server's URL. This is required to register any TCP routes. If not provided here or via link, this defaults to 'https://uaa.service.c.f.internal:8443' route_registrar.routing_api.client_id: -   description: (optional, string) An OAuth client ID for a client that is permitted to add new TCP routes. This is required to register any TCP routes. -   default: routing_api_client +   description: (optional, string) An OAuth client ID for a client that is permitted to add new TCP routes. This is required to register any TCP routes. If set, overrides values provided via routing_api's link. If not provided via link or property, defaults to 'routing_api_client'. route_registrar.routing_api.client_secret: -   description: (optional, string) The OAuth client secret for the above client. This is required to register any TCP routes. +   description: (optional, string) The OAuth client secret for the above client. This is required to register any TCP routes. If set, overrides values provided via routing_api's link. If not provided via link, this must be set when registering TCP routes. route_registrar.routing_api.ca_certs: description: (optional, array of strings) The certificate authority certificates for any APIs that the route registrar is communicating with over HTTPS, e.g., the OAuth server. This is required to register any TCP routes. route_registrar.routing_api.skip_ssl_validation: diff --git a/jobs/routing-api/spec b/jobs/routing-api/spec index 2e5cd361..bea7e6ca 100644 --- a/jobs/routing-api/spec +++ b/jobs/routing-api/spec @@ -47,6 +47,8 @@ provides: - routing_api.reserved_system_component_ports - routing_api.enabled_api_endpoints - routing_api.max_ttl + - uaa.token_endpoint + - uaa.tls_port - uaa.ca_cert - skip_ssl_validation - name: routing_api_db ``` ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.317.0...v0.318.0">https://github.com/cloudfoundry/routing-release/compare/v0.317.0...v0.318.0</a> </pre>

Component	Version	Release Notes
		<pre>## Resources - [Download release 0.318.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.318.0).</pre>
	▼ v0.317.0	<pre>## 0.317.0 **Release Date**: October 21, 2024 ## Changes - Fixes a bug where gorouter was incorrectly calculating HTTP request header lengths when evaluating the `router.max_header_kb` property - Fixes a bug with tcp_router where BOSH was incorrectly determining that the tcp_route r job had templates needing to be updated, when not using backend TLS certificates. ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.316.0...v0.317.0 ## Resources - [Download release 0.317.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.317.0).</pre>
	▼ v0.316.0	<pre>## 0.316.0 **Release Date**: October 17, 2024 ## Changes - Bug fix: Map reserved_system_component_ports to integer - https://github.com/cloudfoundry/routing-release/pull/438 ## Built with go 1.23.2 **Full Changelog**: https://github.com/cloudfoundry/routing-release/compare/v0.315.0...v0.316.0 ## Resources - [Download release 0.316.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.316.0).</pre>
	▼ v0.315.0	<pre>## 0.315.0 **Release Date**: October 17, 2024 ## Changes - Bug fix: Fix memory leak from calling ifr.it.Wait. Fixes https://github.com/cloudfoundry/route-registrar/issues/59. Thank you @bltamara , @charleshansen, and @maxmoehl ! ## Built with go 1.23.2</pre>

Component	Version	Release Notes
		<pre>**Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.314.0...v0.315.0">https://github.com/cloudfoundry/routing-release/compare/v0.314.0...v0.315.0</a> ## Resources - [Download release 0.315.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.315.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.315.0</a>).  ▼ v0.314.0  ## 0.314.0 **Release Date**: October 03, 2024 ## ▲ ▲ ▲ ▲ ▲ **KNOWN ISSUE** ▲ ▲ ▲ ▲ ▲ **CAUTION:** This release is affected by a memory leak in the route registrar job. Users can monitor their VMs' memory usage and monit restart the route_registrar process as necessary. ## Changes - Bump to Go 1.23.2 ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.313.0...v0.314.0">https://github.com/cloudfoundry/routing-release/compare/v0.313.0...v0.314.0</a> ## Resources - [Download release 0.314.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.314.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.314.0</a>).  ▼ v0.313.0  ## 0.313.0 **Release Date**: October 02, 2024 ## ▲ ▲ ▲ ▲ ▲ **KNOWN ISSUE** ▲ ▲ ▲ ▲ ▲ **CAUTION:** This release is affected by a memory leak in the route registrar job. Users can monitor their VMs' memory usage and monit restart the route_registrar process as necessary. ## Changes * Upgrade zap to 1.x, remove zap 0.x in <a href="https://github.com/cloudfoundry/routing-release/pull/434">https://github.com/cloudfoundry/routing-release/pull/434</a>. Thank you @hoffmaen! ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0">https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0</a> ## Resources - [Download release 0.313.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.313.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.313.0</a>). **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0">https://github.com/cloudfoundry/routing-release/compare/v0.312.0...v0.313.0</a></pre>

Component	Version	Release Notes
		<p>▼ v0.312.0</p> <pre> ## 0.312.0 **Release Date**: September 30, 2024 ## △△△△△ **KNOWN ISSUE** △△△△△ **CAUTION:** This release is affected by a memory leak in the route registrar job. Users can monitor their VMs' memory usage and monit restart the route_registrar process as necess ary.  ## Changes - Upgrade to Go 1.23 - [Make ReadHeaderTimeout configurable in r elease] (<a href="https://github.com/cloudfoundry/routi">https://github.com/cloudfoundry/routi</a> ng-release/commit/b4013be629c709437b871f60bc5 b3793f6a8d348) - [fix: bump minimum go version to 1.23 for partitioned cookies ()] (<a href="https://github.com/clo">https://github.com/clo</a> udfoundry/routing-release/commit/f8b9f683418a 8c458db2eb139d1bfd045986c11e) <a href="https://github.c">https://github.c</a> om/cloudfoundry/routing-release/pull/437[] (<a href="https://github.com/cloudfoundry/routing-releas">https://github.com/cloudfoundry/routing-releas</a> e/commit/f8b9f683418a8c458db2eb139d1bfd045986 c11e) - Various Minor Bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/acceptance_tests/spec b/j obs/acceptance_tests/spec index 8122ddaf..51a81762 100644 --- a/jobs/acceptance_tests/spec +++ b/jobs/acceptance_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.22-linux + - golang-1.23-linux - acceptance_tests - rtr - cf-cli-8-linux diff --git a/jobs/gorouter/spec b/jobs/goro uter/spec index 60c7b520..c7896a27 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -364,6 +364,9 @@ properties: Generally, this timeout must be greater tha n that of the load balancer. As examples, GCP HTTP(S) load balancer has a default timeout o f 600 seconds so a value greater than 600 is recommended and AWS ELB has a default timeout of 60 seconds so a value greater than 60 is r ecommended.  However, depending on the IaaS, this timeou t may need to be shorter than the load balanc er's timeout, e.g., Azure's load balancer tim es out at 240 seconds (by default) and GCP TC </pre>

Component	Version	Release Notes
		<p>P load balancer times out at 600 seconds without sending a TCP RST to clients, so a value lower than this is recommended in order to force it to send the TCP RST.</p> <pre>default: 900 +   router.read_header_timeout: +     description: "The amount of time allowed to read request headers." +     default: 0 router.backends.max_conns:   description: "Maximum concurrent TCP connections per backend. When set to 0 there is no limit"   default: 500 diff --git a/jobs/smoke_tests/spec b/jobs/smoke_tests/spec index 02edfd9d..4ea8eb07 100644 --- a/jobs/smoke_tests/spec +++ b/jobs/smoke_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.22-linux + - golang-1.23-linux - acceptance_tests - cf-cli-8-linux ``` ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.311.0...v0.312.0">https://github.com/cloudfoundry/routing-release/compare/v0.311.0...v0.312.0</a> ## Resources - [Download release 0.312.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.312.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.312.0</a>).</pre>
silk	3.52.0	<p>▼ v3.52.0</p> <pre>## 3.52.0 **Release Date**: October 03, 2024 ## Changes - [Upgrade silk-healthchecker] (<a href="https://github.com/cloudfoundry/silk-release/commit/727573775dcbe122423fa1789a3ccf26893125be">https://github.com/cloudfoundry/silk-release/commit/727573775dcbe122423fa1789a3ccf26893125be</a>) - Various dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.51.0...v3.52.0">https://github.com/cloudfoundry/silk-release/compare/v3.51.0...v3.52.0</a> ## Resources - [Download release 3.52.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.52.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.52.0</a>).</pre>

Component	Version	Release Notes
smb-volume	3.9.0	<p>▼ v3.9.0</p> <pre> ## 3.9.0 **Release Date**: November 14, 2024 ## Changes - Dependency bumps ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.8.0...v3.9.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.8.0...v3.9.0</a> ## Resources - [Download release 3.9.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.9.0). </pre>
		<p>▼ v3.8.0</p> <pre> ## 3.8.0 **Release Date**: November 08, 2024 ## Changes - Bump dependancies. - Fix bbr metadata - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/441">https://github.com/cloudfoundry/smb-volume-release/pull/441</a> - Thanks @jochenehret ! ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.7.0...v3.8.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.7.0...v3.8.0</a> ## Resources - [Download release 3.8.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.8.0). </pre>
		<p>▼ v3.7.0</p> <pre> ## 3.7.0 **Release Date**: October 31, 2024 ## Changes - Bump dependancies. ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.6.0...v3.7.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.6.0...v3.7.0</a> ## Resources - [Download release 3.7.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.7.0). </pre>
		<p>▼ v3.6.0</p> <pre> ## 3.6.0 **Release Date**: October 24, 2024 ## Changes </pre>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- Update BBR lock/unlock dependencies - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/438">https://github.com/cloudfoundry/smb-volume-release/pull/438</a> - Thanks @davewalter!</li> <li>- Update for staticcheck compliant error message - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/440">https://github.com/cloudfoundry/smb-volume-release/pull/440</a> - Thanks @geofffranks!</li> <li>- Convert ioutilshim to osshim - <a href="https://github.com/cloudfoundry/smb-volume-release/pull/439">https://github.com/cloudfoundry/smb-volume-release/pull/439</a> - Thanks @geofffranks!</li> <li>## Built with go 1.23.2</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.5.0...v3.6.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.5.0...v3.6.0</a></li> <li>## Resources</li> <li>- [Download release 3.6.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.6.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.6.0</a>).</li> </ul>
smoke-tests	4.10.0	
syslog	12.3.3	
tanzu-jammy-stack	1.0.1	

## 6.0.9

**Release Date:** 10/07/2024

- Bump bpm to version [1.4.0](#)
- Bump cf-networking to version [3.51.0](#)
- Bump cflinuxfs3 to version [0.416.0](#)
- Bump cflinuxfs4 to version [1.130.0](#)
- Bump diego to version [2.105.0](#)
- Bump garden-runc to version [1.57.0](#)
- Bump mapfs to version [1.4.0](#)
- Bump nfs-volume to version [7.4.0](#)
- Bump silk to version [3.51.0](#)
- Bump smb-volume to version [3.5.0](#)

Component	Version	Release Notes
ubuntu-jammy stemcell	1.572	
bpm	1.4.0	

Component	Version	Release Notes
cf-networking	3.51.0	<p>▼ v3.51.0</p> <pre> ## 3.51.0 **Release Date**: September 24, 2024 ## Changes - Bump to Go 1.23 - [Add ReadHeaderTimeout option on the server] (<a href="https://github.com/cloudfoundry/cf-networking-release/commit/a32d19d7120dfec4037121232b84c238f3eaa2f3">https://github.com/cloudfoundry/cf-networking-release/commit/a32d19d7120dfec4037121232b84c238f3eaa2f3</a>) - [Pass ReadHeaderTimeout to lagerlevel Server] (<a href="https://github.com/cloudfoundry/cf-networking-release/commit/b1fc8c3ad3abfd94fbcafd9b2c4c32987c556222">https://github.com/cloudfoundry/cf-networking-release/commit/b1fc8c3ad3abfd94fbcafd9b2c4c32987c556222</a>) - [Fix file/dir creation permissions] (<a href="https://github.com/cloudfoundry/cf-networking-release/commit/2a095f5b94a449585a3082e60cd0d1466d1611ed">https://github.com/cloudfoundry/cf-networking-release/commit/2a095f5b94a449585a3082e60cd0d1466d1611ed</a>) - [Catch or explicitly ignore unhandled errors] (<a href="https://github.com/cloudfoundry/cf-networking-release/commit/a4d4085dfeb78c3ee06bad109ba073f6a853d80f">https://github.com/cloudfoundry/cf-networking-release/commit/a4d4085dfeb78c3ee06bad109ba073f6a853d80f</a>) ## Bosh Job Spec changes: ``` diff --git a/jobs/performance-test-sd/spec b/jobs/performance-test-sd/spec index 0583340e..fd83a044 100644 --- a/jobs/performance-test-sd/spec +++ b/jobs/performance-test-sd/spec @@ -6,7 +6,7 @@ templates:  config.json.erb: config.json  packages:  - - golang-1.22-linux + - golang-1.23-linux  - performance-test-sd  consumes:  diff --git a/jobs/service-discovery-controller/spec b/jobs/service-discovery-controller/spec index 6786aad9..46deb276 100644 --- a/jobs/service-discovery-controller/spec +++ b/jobs/service-discovery-controller/spec @@ -51,6 +51,10 @@ properties:  description: "Interval in seconds for which the route emitter is told to emit all routes. This value should be less than the staleness_threshold_seconds"  default: 60  + read_header_timeout: +   description: "The amount of time allowed to read request headers" +   default: 30s +  dnshttps.server.tls:  description: "Server-side mutual TLS config </pre>

Component	Version	Release Notes
		<pre>uration for dns over http" dnshttps.client.ca: ``` ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.50.0...v3.51.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.50.0...v3.51.0</a> ## Resources - [Download release 3.51.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.51.0).</pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
cflinuxfs3	0.416.0	<p>▼ v0.416.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.416.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.416.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.416.0</a>)</p> </div>
		<p>▼ v0.415.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.415.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.415.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.415.0</a>)</p> </div>
		<p>▼ v0.414.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.414.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.414.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.414.0</a>)</p> </div>
		<p>▼ v0.413.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.413.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.413.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.413.0</a>)</p> </div>
		<p>▼ v0.412.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.412.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.412.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.412.0</a>)</p> </div>
		<p>▼ v0.411.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.411.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.411.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.411.0</a>)</p> </div>
		<p>▼ v0.410.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.410.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.410.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.410.0</a>)</p> </div>

Component	Version	Release Notes
		<p>▼ v0.409.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.409.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.409.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.409.0</a>)</p></div> <p>▼ v0.408.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.408.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.408.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.408.0</a>)</p></div>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
cflinuxfs4	1.130.0	<p>▼ v1.130.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.130.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.130.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.130.0</a>)</p> </div>
		<p>▼ v1.129.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.129.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.129.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.129.0</a>)</p> </div>
		<p>▼ v1.128.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.128.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.128.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.128.0</a>)</p> </div>
		<p>▼ v1.127.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.127.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.127.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.127.0</a>)</p> </div>
		<p>▼ v1.126.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.126.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.126.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.126.0</a>)</p> </div>
		<p>▼ v1.125.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.125.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.125.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.125.0</a>)</p> </div>
		<p>▼ v1.124.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.124.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.124.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.124.0</a>)</p> </div>

Component	Version	Release Notes
		<p>▼ v1.122.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.122.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.122.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.122.0</a>)</p></div> <p>▼ v1.121.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.121.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.121.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.121.0</a>)</p></div> <p>▼ v1.120.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.120.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.120.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.120.0</a>)</p></div> <p>▼ v1.119.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.119.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.119.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.119.0</a>)</p></div> <p>▼ v1.118.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.118.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.118.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.118.0</a>)</p></div> <p>▼ v1.117.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.117.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.117.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.117.0</a>)</p></div> <p>▼ v1.115.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.115.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.115.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.115.0</a>)</p></div>

Component	Version	Release Notes
		<p>▼ v1.114.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.114.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.114.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.114.0</a>)</p></div> <p>▼ v1.113.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.113.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.113.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.113.0</a>)</p></div> <p>▼ v1.108.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.108.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.108.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.108.0</a>)</p></div>
cf-cli	1.67.0	
count-cores-indicator	2.0.0	

Component	Version	Release Notes
diego	2.105.0	<p>▼ v2.105.0</p> <pre> ## 2.105.0 **Release Date**: October 01, 2024 ## Changes - Upgrade to Go 1.23! - [add healthcheck metrics property](https://github.com/cloudfoundry/diego-release/commit/fe3aae75d48e6340b526e1d5d327732cd7bf1a8c) - [add healthcheck property to rep_windows config template](https://github.com/cloudfoundry/diego-release/commit/7dce01426b119d53d0b8923e2681884bb5a4cab7) - [add missing default params for linters](https://github.com/cloudfoundry/diego-release/commit/e9ccee2dd2bf78c83b15d27c711669c67261d103) - [add metadata to docs and reorder them](https://github.com/cloudfoundry/diego-release/commit/af178fa335254d47a8fd507822003c60bad4ba59) - Various dependency bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/rep/spec b/jobs/rep/spec index 405f90f46..0737d9d1a 100644 --- a/jobs/rep/spec +++ b/jobs/rep/spec @@ -235,7 +235,9 @@ properties: enable_declarative_healthcheck: description: "When set, enables the rep to prefer the LRP CheckDefinition to healthcheck instances over the Monitor action. Requires Garden-Runc v1.10.0+" default: false - + enable_healthcheck_metrics: + description: "When set, enables the rep to emit healthcheck failure metrics. Requires enable_declarative_healthcheck to be set to true." + default: false cell Registrations.locket.enabled: description: Enable the cell rep to register itself as a service with Locket. default: true diff --git a/jobs/rep_windows/spec b/jobs/rep_windows/spec index 0521d1061..4a7dfefc6 100644 --- a/jobs/rep_windows/spec +++ b/jobs/rep_windows/spec @@ -237,13 +237,16 @@ properties: diego.rep.locket.client_keepalive_timeout: description: "Timeout in seconds to receive a response to the keepalive ping. If a response is not received within this time, the locket client will reconnect to another server." </pre>

Component	Version	Release Notes
		<pre> default: 22 - + enable_declarative_healthcheck: description: "When set, enables the rep to prefer the LRP CheckDefinition to healthcheck instances over the Monitor action." default: false declarative_healthcheck_path: description: "The directory containing the declarative healthcheck binary" default: "/var/vcap/packages/healthcheck_windows/external" + enable_healthcheck_metrics: + description: "When set, enables the rep to emit healthcheck failure metrics. Requires enable_declarative_healthcheck to be set to true." + default: false cell_registrations.locket.enabled: description: Enable the cell rep to register itself as a service with Locket. diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index d61278357..901e5236d 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ --- name: vizzini packages: - - golang-1.22-linux + - golang-1.23-linux - vizzini templates: ``` ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.104.0...v2.105.0">https://github.com/cloudfoundry/diego-release/compare/v2.104.0...v2.105.0</a> ## Resources - [Download release 2.105.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.105.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.105.0</a>).</pre> <p>▼ v2.104.0</p> <pre> ## 2.104.0 **Release Date**: September 24, 2024 ## Changes - Bumped to Envoy to 1.28.7 - [Update file permissions for BBS access log] (<a href="https://github.com/cloudfoundry/bbs/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718">https://github.com/cloudfoundry/bbs/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718</a>) - [Update file permissions for Buildpack App Lifecycle access log] (<a href="https://github.com/cloudfoundry/buildpack-lifecycle/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718">https://github.com/cloudfoundry/buildpack-lifecycle/compare/9be69c0199dbd4818203b7382454616d56463e69...4b574f98c713f8e77467ec6a4ac953ab52ddc718</a>) </pre>

Component	Version	Release Notes
	1.04.0	<pre> oudfoundry/bbs/compare/9be69c0199dbd4818203b7 382454616d56463e69...4b574f98c713f8e77467ec6a 4ac953ab52ddc718) - [Update file permissions for cacheddownlo ader] (<a href="https://github.com/cloudfoundry/cacheddownloader/compare/09b8631e33d0adb38bbae81529b63fa3f92d0925...a52cc2a85daa3e138cead7c748881d24af914c4a">https://github.com/cloudfoundry/cacheddownloader/compare/09b8631e33d0adb38bbae81529b63fa3f92d0925...a52cc2a85daa3e138cead7c748881d24af914c4a</a>) - [Update file permissions for Executor] (<a href="https://github.com/cloudfoundry/executor/compare/0a01dbe448f78e493c86b0d2672a646f43e9a53...a8f0e01a67921c94cfabfc933bb436f1c101faae">https://github.com/cloudfoundry/executor/compare/0a01dbe448f78e493c86b0d2672a646f43e9a53...a8f0e01a67921c94cfabfc933bb436f1c101faae</a>) - [Update file permissions for Inigo] (<a href="https://github.com/cloudfoundry/inigo/compare/18074ea13ef2ca3a6195fed63ce639b2e677ee39...3d1daff34a1d91f50f1615cc6089658f953c7d59">https://github.com/cloudfoundry/inigo/compare/18074ea13ef2ca3a6195fed63ce639b2e677ee39...3d1daff34a1d91f50f1615cc6089658f953c7d59</a>) - Various dependency bumps ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.103.0...v2.104.0">https://github.com/cloudfoundry/diego-release/compare/v2.103.0...v2.104.0</a> ## Resources - [Download release 2.104.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.104.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.104.0</a>). </pre>
garden-runc	1.57.0	<p>▼ v1.57.0</p> <pre> ## 1.57.0 **Release Date**: October 02, 2024 ## Changes - Upgrade to Go 1.23 - [Create a top-level dir for libtool] (<a href="https://github.com/cloudfoundry/garden-runc-release/commit/fb83c7757f43ec7d4f39b7a9d5fbacbdbd224b11">https://github.com/cloudfoundry/garden-runc-release/commit/fb83c7757f43ec7d4f39b7a9d5fbacbdbd224b11</a>) ## Built with go 1.23.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.56.0...v1.57.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.56.0...v1.57.0</a> ## Resources - [Download release 1.57.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.57.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.57.0</a>). </pre>
loggregator-agent	8.2.1	

Component	Version	Release Notes
mapfs	1.4.0	<p>▼ v1.4.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 1.4.0 **Release Date**: September 25, 2024 ## Changes - Bump to Go 1.23 - Minor dependency bumps ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.3.0...v1.4.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.3.0...v1.4.0</a> ## Resources - [Download release 1.4.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.4.0).</pre></div>

Component	Version	Release Notes
nfs-volume	7.4.0	<p>▼ v7.4.0</p> <pre> ## 7.4.0 **Release Date**: October 01, 2024 ## Changes - Updates the nfsbrokerpush errand to apply the security group to staging containers as well as running, for greater success talking to credhub in test environments. Thanks @jochenehret! - Updates the BBR metadata to add more CAP I dependencies to resolve intermittent lock/unlock race conditions when running pre-restore actions in BBR. Thanks @davewalter! ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.3.0...v7.4.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.3.0...v7.4.0</a> ## Resources - [Download release 7.4.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.4.0). </pre> <p>▼ v7.3.0</p> <pre> ## 7.3.0 **Release Date**: September 30, 2024 ## Changes - [Output rpcbind and statd logs to a sensible place] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/bb54df64b42100c5c64b98a2818258f2a51cb79e">https://github.com/cloudfoundry/nfs-volume-release/commit/bb54df64b42100c5c64b98a2818258f2a51cb79e</a>) - [Add retries for monit statd and rpcbind check] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/03f06e61244424593f34b446e0b7a7dce06d6773">https://github.com/cloudfoundry/nfs-volume-release/commit/03f06e61244424593f34b446e0b7a7dce06d6773</a>) - [Remove sqlite] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/86327f2336d4bfeadc2bb0389d981c41f6815750">https://github.com/cloudfoundry/nfs-volume-release/commit/86327f2336d4bfeadc2bb0389d981c41f6815750</a>) - [Remove libevent and rpcsvc-proto] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/6e818a0ca00f79f8117d69eebab95a7273170239">https://github.com/cloudfoundry/nfs-volume-release/commit/6e818a0ca00f79f8117d69eebab95a7273170239</a>) - [Remove nfs-legacy option] (<a href="https://github.com/cloudfoundry/nfs-volume-release/commit/bc3fbcc7a609434acb966fab601df110be18a2f0b">https://github.com/cloudfoundry/nfs-volume-release/commit/bc3fbcc7a609434acb966fab601df110be18a2f0b</a>) - [Output rpcbind and statd logs to a sensible place #1024] (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1024">https://github.com/cloudfoundry/nfs-volume-release/pull/1024</a>) - [Add retries for monit statd and rpcbind check #1027] (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1027">https://github.com/cloudfoundry/nfs-volume-release/pull/1027</a>) - [Add retries for monit statd and rpcbind check #1027] (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/1027">https://github.com/cloudfoundry/nfs-volume-release/pull/1027</a>) - [Remove unneeded packages for nfs-debs #1](#) </pre>

Component	Version	Release Notes
		<p>035</p> <ul style="list-style-type: none"> <li>- [Remove nfs-legacy option #1036](https://github.com/cloudfoundry/nfs-volume-release/pull/1036)</li> <li>- Various Dependency Bumps</li> <li>## Bosh Job Spec changes:</li> <pre>```diff diff --git a/jobs/nfsbrokerpush/spec b/jobs/nfsbrokerpush/spec index 9bf3138..bb67a94 100644 --- a/jobs/nfsbrokerpush/spec +++ b/jobs/nfsbrokerpush/spec @@ -97,29 +97,6 @@ properties: nfsbrokerpush.services: description: "List of services and plans supported by broker" default: - id: nfsbroker - name: "nfs-legacy" - description: "Existing NFSv3 volumes (Deprecated)" - bindable: true - plan_updatable: false - tags: ["nfs"] - requires: ["volume_mount"] - metadata: - display_name: "Legacy NFS V3 Volume Broker" - image_url: data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAQAAQABdCAYAAAAZEEJAAAKw21DQ1BJQ0MgUHJvZmlsZQAASImVlgdUU1kax+976Y2WEIqUEOR3gJICT2AgnSwEZKQhBJCCip2ZXAE4KICnjQEREFxwLIWBALFgYBex2QQUVdBws2VPYBS9jZPbt79p9zc3/5ct/3vu+9e8/5A0B+z5VKs2ANALlCl1MaAAjKTmFgXsCIOSDB5aAwuXJpezo6EiAaHL+qz7cRtYiumE3luvf//+v0uQL5DwAoGiE0/hyXjbCx5FxnyeVKQBAbULiZgsV0jFG4oAmQwpE+PIYCyf44RinTfdQ+Jq4mEAA0GgA8GQuVvYEgIx0CBh5PCGSh+yIsKOEL5YgnIqwL0/E5SO8G+Hp2dk5Y9yBsFXaP+UR/iVnmionlytU8UQv48IHieXSL07i//Nx/G91Zykn72GGDLJIFhaDzJZjzy0zJ0LFkrRZUZMs5o+vH2eRMix+knnywJRJ5nODIizZmRnPnmSubOraFFfc4iTlcmJu+SVZsyJV+QUcfQvkwbGTnC4O4ajqUXDiJjlPnDBrkuWzsRFT9wpUxWXKGFXN2fKpetJlIap+RWKOar1CFBem6pE7VYNAnqSqjs8IC1bFJfGqNVJFgCqnNct6qpesUFVcnherulaBbLZJzuCGR0/liVb1COKACCiBBPCBAMhAGsgBWUABGCAIiIEcsJFfXIBsFYVgkWKsucAc6WKZWChSMNjIIriwOBKe/XSGs6MTc4Cx8znxt/Rx88dRL86FcttBcCzCAkKp2JcZJ+cfAoA9cNUzOwtsnWQs3W6i6eU5U3E0GNfGEAE6oAG9IARsr+sgBlwBu7AG/iDYBAoopBoksF8wEP6yUY6WQiWglWgEBSDTWArqAC7wF5wABwGR0ETOAXOgUvgGugCt8AD0AsGwEsWBD6AEQiCcBAFokJ6kDFkAdlCzhAL8oWCoUgoBkqGUiEhJIGU0FJoDVQM1UA0B6oFvoFOgmdg65A3dA9qA8ahN5CX2AUTIZpsCFsCTvALJgNR8Bx8DxYCOFC+XABvAEuh6vhQ3Ajfa6+Bt+CetGX8DAKoEgoOsoEZYdioQJRUagUVDpKh1qOKkKVoaP9agWVDVqBqoX9Qr1GY1FU9EMtB3aGx2Gjkf</pre> </ul>

Component	Version	Release Notes
		<p>z0Lno5ej16Ar0AXQj+gL6BroPPYT+jqFgDDC2GC8MB50E  EWIWYgoxZZj9mBOYi5hbAmHMBwyWS8cysR7YMGwyNg07B  LseuwPbgG3FdmP7scM4HE4PZ4vzwUXhuDgFrhC3HXcIdx  bXgxvAfcKT8MZ4Z3wIPgUvwa/G1+EP4s/ge/DP8CMEDYI  FwYsQReATFhM2EvYRWgjXCQOEeAImkUn0IcYRM4iriOXE  euJF4kPiOxKJZEryJM0miUkrSeWkI6TLpD7Sz7IW2YYcS  J5LVpI3kGvIreR75HcUCsWS4k9JoSgoGyi1lPOUx5RPal  Q1ezWOG19thVqlWqNaj9prdYK6hTpfb56vnqZ+jH16+q  vNAgalhqBGlyN5RqVGic17mgMa1I1nTSjNLm112se1Lyi  +WvLp2WpFazF1yrQ2qt1XqufiqKaUQOpPOoa6j7qReoAD  Utj0ji0DFox7TCtzakraXtqp2gvUi7Uvu0di8dRbekc+  hZ9I30o/Tb9C86hjpsHYHOOp16nR6dj7rTdP11BbpFug2  6t3S/6DH0gvUy9TbrNek90kfr2+jP1l+ov1P/ov6rabRp  3tN404qmHZ123wA2sDGIMVhisNegw2DY0Mgw1FBquN3wv  OEri7qRv1GGUanRGaNBY6qx7HyuNT4rPELhjaDzchild  MuMIZMDEzCTJQme0w6TUZMmabxpqtNG0wfmRHnwGbpZqv  mbWZD5sbmM82XmteZ37cgWLAsRBbbLNotPloyLRMt11o2  WT5n6jI5zHxmHfOhFcXKzYrXqtrqpjXWmmWdab3DussGt  nGzEd1U21y3hW3dbcW202y7p20Me06XTK+efseObMe2y7  Ors+uzp9tH2q+2b7J/7WDukOKw2aHd4bujm2OW4z7HB05  aTuFOq51anN462zjznCudb7pQXEJcVrg0u7xxtXUVu050  vetGdZvpttatze2bu4e7zL3efdDD3CPVo8rjDovGimatZ  132xHgGeK7wPOX52cvds+F110tPbzvvTO+D3s9nMGcIZu  yb0e9j6sP12ePT68vwTfxd7dvrZ+LH9av2e+Jv5s/33  +//jG3NzmAfYr8OcAyQBZWI+BjoFbgssDUIFRQaVBTUGa  wVHB9cEf4x4xDREGFIXMhTqFroktDUMExYRtjnsDseQw+p  UcobCPcKXhV+IIeffER1REPIm0iZRFtsyEZ4bP3DLz4SyL  WZJZTVegih01JepRNDM6N/rX2djZ0bMrZz+NcyPZgtMeS  41dEHsw9kNcQNZGuAfxVvHK+LYE9YS5CbUJHxODEksSe5  MckpY1XUvWTxYnN6fgUhJS9qcMzwmes3XowFy3uYVzb89  jzls078p8/f1Z808vUF/AXXAsFZOamHow9Ss3ilvNHU7j  pFW1DfECedt4L/n+/FL+oMBHUCJ4lu6TxpL+XOgj3C1cF  PmJykSvxIHicVgbjLCMXRkfM6MyazJHSxKzGrLx2anZJy  VakKzJhRyjnEU53VJbaaG0N9crd2vukCxCt180yefJmxU  0xAh1KK2UPyj78nzzKvM+LuxYeGyR5iLJoo7FNovXLX6W  H5L/8xLoEt6StqUmS1ct7VvGXrZnObQ8bXnbCrMVBSSGV  oauPLCKuCpz1W+rHVeXrH6/JnFNS4FhwCqC/h9Cf6grVC  uUFd5Z671214/oH8U/dq5zWbd93fciftHVYsfisuKv63n  rr/7k9FP5T6Mb0jd0bnTfuHMTdpNk0+3NfpsPlGiW5Jf0  b5m5pbGUUVpU+n7rgq1XylzLdm0jblNu6y2PLG/ebr59  0/avFaKKW5UB1Q1VB1Xrqj7u40/o2em/s36X4a7iXV92i  3ff3RO6p7HasrpsL3Zv3t6n+xL2tf/M+r12v/7+4v3fai  Q1vQdiDlyo9aitPWhwcGMdXKesGzw091DX4aDDzfV29Xs  a6A3FR8AR5ZEXv6T+cvoxNG2Y6xj9cctjledoJ4aoaoqa  FzcONYmaepuTm7tPhp9sa/FuOfGr/a81p0xOVZ7WPr3xD  PFMwZnRs/lnh1ulra/OCC/1tyloe3A+6fzNC7MvdF6MuH  j5Usil8+3s9rOXfs6fuuJ15eRV1tWma+7XGjvcOk785vb  biU73zsbrHtebuzy7WrpnDj/p8es5dyPoxqWbnJvXbs26  1X07/vbd03Pv9N71331+L+vem/t590cerHyIeVj0SONR2  WODx9W//e00vee7ovqK/jSeyTB/28/pd/yP/401Dw1P  K07Jnx9rnzs9PDYYMdR2Y82LgpFTlyKvCv2n+req11ev  jf/r/2TGUNDTwRvZm9036d3rvat67vm8bjh5+/CH7w8jH  ok96nw58Zn1u/5L45dnIwq+4r+XfrL+1fI/4/nA0e3RUy  pVxx60AChlwejoAb2sAoCQj3qELAOkcCf88LmjC848T+E  884bHH5Q5AjT8A8SsBiEQ8yk5kWCBMruYxyxTnD2AXF9X  4h+TpLs4TuciIC8V8Gh19ZwgArgWaB7LR0ZEdo6Pf9iHF  3gOgNXfCt48Ji3jxEqaOCe5BpwNzJfgX/R2N5g2xmShwc</p>

Component	Version	Release Notes
		<p>wAAAZtpVFh0WE1MOmNvbS5hZG9iZS54bXAAAAAAAdx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iIHg6eG1wdGs9I1hNUCDBd3J1IDUuNC4WIj4KICAgPHJkZjpsREYgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj4KICAgICAgPHJkZjpeZXNjcm1wdG1vbiByZGY6YWJvdXQ9IiIKICAgICAgiCAgICAgeG1sbnM6ZXhpZj0iaHR0cDovL25zLmFkb2J1LmNvbS9leGlmLzEuMC8iPgogICAgICAgICA8ZXhpZjpQaxH1bFhEaW1lbnNpb24+ODQ8L2V4aWY6UG14ZWxYRGltZW5zaW9uPgogICAgICAgICA8ZXhpZjpQaxH1bF1EaW1lbnNpb24+OTM8L2V4aWY6UG14ZWxZRGltZW5zaW9uPgogICAgICA8L3JkZjpeZXNjcm1wdG1vbj4KICAgPC9yZGY6UkRGPgo8L3g6eG1wbWV0YT4KE9hEygAADTRJREFUeAHTXVtsHNuz/ry7s3d7196s4xuJc3GEExpiQahCASWioJJSBdSkVdOqiAf61IqiSn1APPJE2wceSiUUCfUiJGQqe1EBJW31tm1QiwiEGofimNgEG19315e9X9z/n9nZnZmd3aztsyYxc+Tjc5kz/5zzzX8u+885/9+0Qg6WE4aATRgli5CMgAWoYEawABUMqEMwvRK5fGEFc4tpzEQTWExksJTMks9h0ZXFcoLjFCY5P4dMLo9srkBhAbliqKY5zOYLkOw2SA4bnOTV0KFJuyQ7fG4Hmj1O8hJ85Dls9nCehIDPiS0BD8IBN+y2p1I9RUea1jMpptJ5fPZZEKY+W8C1mWXMLKRkAKEiKUSWUrgRp7smwrK12YW0Vg+2Br3oaPOge4sPfZ0B705qgVNax6ddFaDzS2mcfedTDH8Sw5UJAnE2bv6CqdIOhwS75ICDvcOBJhtV1P6ammwyUuaa2FMeJeU8OS3nU5rzi2UoAhtxVIE4nt8QL0pkXyjIL6yUXqF0gYtwfrFMXgkLK3nks+xzyLHP5WRaxsrTo9BD407uDmDf91Z8daAbIQJ/Ne66gC6nchh6fxJnLnyK90bn5UbID6BGS05J8ZIEh4s8pwk8GwPYuF61mvaZluWek6dhJp/LIptRfk4YZtOZEtjchoFdITx4Rw+O3N4Fr+v6I2RVQHnceuXvH+NXZz8Cd212DpcTPr8PnmYfXJ7VvTnTlt2gme1kGon1ZSSXEpABpnp6nHY89uAefPu+XXDYq30LKaBv/28WP3v1fUxGEuBVf3NrC1ragjI33qAYNKxa2XQWi9EYlqKLYBi72rw49a39uKMvbPrMckD/OxbFD3/xL/As7WnxozXc9oUE0ogWDw2xmXkkluLyKuGXP7oH/duCxmI8TzTdTcYFU6f/LYPZ0hpAe/dWC8wiPDxfhHs64CdcnKyp2nCy+h0gL7yj1F5fehlzuzYYixrpQmBEOhbfYjFs9gkPAyOh2gH1yNyNf9wRZj0SutQcAfjZT18ajmlwlqgP0Mq0v2Tndm3cGV5q9vv90t1smwPON0ekAVS9mUmklaoUmCGRSlWOnWswU0KXYonrdCk0QWK6BjymgycV1RKfnTUhzWZGpOXnpVA0J099SNrsdi5EYstksAqHWTf2rqBowxvw0DYMLS1Ek1+N0IsnXcv2SNHOmgHbu6EGUF7HEqUlayPIk5Q8GaLnhgd1hN6OzKfPy+TxhEAd3cXVekZeU7SMXkBk3bbMpoCwhCtOipk2L2AgBm0mSOG5qhjyIW91gom6vRxaisORos7gCSU1y9FMzGU8QJyaQTiRLTXNRe/1Xo8urzPC1C4aIKaBqGb65s7ebBARZxJeWsbywhDSBy54di9gcxL0utxOSywUn/Zqw0cuwU5ew2ew3pMSJU2FAkmaqMsWSIzHPymZ+9KpDLK8uuECRcfSM1+gmbwfEknU6nE1AVUJSCSaC7paEdzSSmCmkai3106kkeomkSVw2Zs5HovZ20myzgDbGGg5j0M1bi/KPs3uX00ey0DzJCMtUDctMFjkeZzjbssAcn6epP8cVnNcN+6BbmIk5si1SNTqAlRbAX6I/KCQksvilQY5Q6EswCUZY46Eufz2lcblksMR443kWF7roE8mqhDcSWJJBpNE4XrdqgE1PpArYVYR5hiWjjPIBZ1zFK4pkES9QMLdUh5do35mJLuGNEn25aGGe0OxJ8hhUtcwiAxmi8f9dQNareU8vqoS/WplNmO+6cJ+MzZ0o9pkASoYaQtQC1DBCAGmZ3GoBahgBASTszjUAlQwAoLJWRxqASoYAcHkLA61ABWMgGBYFodagApGQDA5i0MtQAUjIJicUAHz3ru248f99FVwxYb44gKe+v1k9eqG2vHcQ/SdiqTs8zkInnpjWimr5nPfMf/0raMp2XJ4/c+jGNTuywi14cmvtGJfyAmvYbdx1k6hjE0tYfAvUxjWURKTENr1g14HvPSZwe </p>

Component	Version	Release Notes
		<p>tsQnhLEM8e81WvZZD2W7qprNSEoE/zXtV82oLt5evX8ZL      TibB23+u+Hrz0aAcOtrsqwOTKSG4Jfb1tePqxXthWvXzr      viIiUUNDhCq3r7e/CCW2GNm7+oRQw5GfpJEdtn0NcvSe0F      S8ea0H2g2+CTq6MfBbHyFwKC1nNtyvJhRPf34m7tXUSEN      ewhgBqRhI2CUePd2Pw1Qnj1frs+TR++tJo3V1zb78fxpV      yPovXz4zgZcojD9+zA4/d6lFAd7px+HY3z19U34h689pD      sRxqrAeNgRjt4anZ9Y33GNLthnSt5IEtzf6YHZupAJPvH      Tp3FWfnyt/mw+HSK6hFuu5rjQW0SL1m179OVVF1SV8zit      lprKzmzl+jzRk01CRSdcSyh0h1WgZ88uv1HhlnemxKzE      4dwTRxXvL1tz1V6Dsqa6vMu9FcjjarxmxC3S348XjPgxd      nsPLL/Qn/sYujOPxC/XRXG2phgHqzC3g1DsSfntQmemVr      h/DM2/pG1ezwnYXHjnSjc09DHjtyztJH7h3FyJxPC5KC      b7OpSXSLneoA9HaaVx9C7iRjrAO0FnUP1Y5eCHq6hDiXp      9kYYBSntdgIvjGNrZj8MhZYde7z6a9d8awWB9daNSTdi7      K1C9dMGFYQJ0qFQig1N/tOG5r7ejS7urh16I185s9rHff      sCxQ3mM0VnV02emMfa6V0yksWMo1fH0a9OYLc0ByqvvV7      32rsC6W1cxxs7P4dSvh3H63RhGonSOs/RsDUnaFNa7rq3      Pfnf7TbZsktsQwfPvn+PZAW3Xn8czH2nWhJq26qKFLM6e      n8E4AWDe5dM4r7uhnBi6MImh4ji5d1cbDt7iR187HeVu0      dDy+PDEN7tx/ncT5RvXGwtcl9dujCeBoW3arn8Ljs3Eka      UyZkCVbqWNZSMfLlQFrVsUgL71jaEfRKcNLYOX1ooXR4      ejYC94gJ48jj9kgoqk5fU4pa5tNqLKRGPm9LwLq/Ww9j1      Hz1Em1g1xy13Jrd7i48cU8HTgyEcOy25hpkFvD8q9OYV      J9td2Jvd43iq7y0YYAC3PXLs6tE6izWqTxB31S3Zms6HT      8/Wdy/qi+kprTDTR6kieKY20BAAbnrz2sbI6wdwGgMEzy      GyM6Oow+T8KMkqCcfolWA2vJ8Dpe0kiqVxBrDDR1DtXXj      rr/n8fJaUXtfffE4Xr6cxNP7PQoZFn482o8HY21cnU9jN      rWCYNCF3rAbYZKGqW52YrFuWYF6T61QfU+1ygi+FseLmq      5fQdywnNIuJyvKGjKG/3MVg5+U2JSuNiEQdOMArWUF2BF      EwW7SiqMBMzFPMtSz5R8GBnJrSgoGtNydm+ly3Fgz7vpa      AYX25AWIk0qQ00/tGePN10n/gSRML7y7gMlk9ednaZv68      JUZ/OA1ccsltVo6jQ73/uRPCv72/13q9zs890HwPuJKX3      HtSSdAJqeWMTSx/1lo/PkojM0/f/4NHUYbPobqnt7wRBx      DBsFIox8puMs3uro3Pn0LUMHvyALUA1QwAoLJWRxqASoY      AchkLA61ABWMgGByFodagApGQDA5i0MtQAUjIJicxaEWo      IIREEzO41ALUMEICCZncagFqGAEBJPTcSibc2CXywg2yw      t+6M1OjtW7sVPx0rZHB+gBsirAlhkV/DQFrbiCgKsaJD      dw05Kxd86QE8e6ZMtwsySnkz1LsgkrP8qAtx7F+eishGW      k0d2q9mlUAfojg4/Tp3Yjxx9bp0emyCthRW7L0s3fhEjj      MFU+KeygsJnvjOA3q3+ChgqPiN/7c5b8M6vebzx9jVMXr      OGj88rm63w+ItbXCpIbo4M1n7J+kSXIgtIUCju4S9vk42      tmLVct9FBLCWP52cQK/+esVXCV7SezY1I+HDkt42bAK      qYNspEI+tR6fV8iKEFokzpPNVLCWX1VF5s70Znzv/t24/      0APtd+8dqAAouyoZU3yfTP0MVJ2S1IXX2Pth6xf00nWtv      idsIv0ut/MqoTzpJqTu70imJX0o8aTZJtJ2UDqpqOW9+3      vxEN39uDOPWEtNKbx6wKq3sUmg5dmpLtk138mPQzp/Wb      1x1QPndpo1BRwkohAW+n7dx8jRVBq2ooWQNuox1rsGVQW      CGrqpiVbShxnOcIWbcpm27LkN5TCrX067Ljw04QHhjowb      23dcK1io2sdQoqfSAb3+Kh4OLYPNjcxQcEsJmhEe09uji      pwLTAVXR7qlbAuB+xmkybYgasaA1MyStZ8WLGoS7Jekg5      jyL0x5a9ivpJCTDWTarbgKZ7eGWC15037Wjd18jvp4010      ztbqnbpypyrv10WsCVE9CSTHHTkeTmi01MM226WJJ2U/LRv      7YoB97xcgf49BoR+8FFjpN5ycjf34y8tfida196FF8qxt      byeAfpzvJPpKbTj6LcsIArbdCDGY8TcDKACTAZ+jsC1tM      ZCtjGfJai4lyPl1TLSXqQho62JoiW1Jkq4leArDZyyCSM      moyd8agbrTbcEA3uoEb/bzGzw4b3aLP+Xn/BwZ8DglkGH      aWAAAAAE1FTkSuQmCC</p>

Component	Version	Release Notes
		<ul style="list-style-type: none"> <li>- long_description: "Legacy broker for existing NFSv3 volumes (deprecated)"</li> <li>- provider_display_name: "Dell / Pivotal"</li> <li>- documentation_url: <a href="https://docs.cloudfoundry.org/devguide/services/using-volume-services.html">https://docs.cloudfoundry.org/devguide/services/using-volume-services.html</a></li> <li>- plans:</li> <li>- - id: Existing</li> <li>- name: "Existing"</li> <li>- description: "A preexisting filesystem"</li> <li>- metadata:</li> <li>- costs: <ul style="list-style-type: none"> <li>- amount:</li> <li>- usd: 0.0</li> <li>- unit: "MONTHLY"</li> <li>- display_name: "Existing Filesystems"</li> </ul> </li> <li>- id: "997f8f26-e10c-11e7-80c1-9a214cf093ae"</li> <li>- name: "nfs"</li> <li>- description: "Existing NFSv3 and v4 volumes (see: <a href="https://code.cloudfoundry.org/nfs-volume-release/">https://code.cloudfoundry.org/nfs-volume-release/</a>)"</li> <li>- ``</li> <li>## Built with go 1.23.1</li> <li>**Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.2.0...v7.3.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.2.0...v7.3.0</a></li> <li>## Resources</li> <li>- [Download release 7.3.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.3.0">https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.3.0</a>).</li> </ul>
otel-collector	0.10.1	
routing	0.311.0	

Component	Version	Release Notes
silk	3.51.0	<p>▼ v3.51.0</p> <pre> ## 3.51.0 **Release Date**: September 24, 2024 ## Changes - Bump to Go 1.23.1 - [Fix file/dir creation permissions] (<a href="https://github.com/cloudfoundry/silk-release/commit/a085a2b0909ad849bce96e142381bdf67658990f">https://github.com/cloudfoundry/silk-release/commit/a085a2b0909ad849bce96e142381bdf67658990f</a>) - [Catch or explicitly ignore unhandled errors] (<a href="https://github.com/cloudfoundry/silk-release/commit/460ea10df9e8b8d32179b53ac5e22e1fb58a4da">https://github.com/cloudfoundry/silk-release/commit/460ea10df9e8b8d32179b53ac5e22e1fb58a4da</a>) ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.50.0...v3.51.0">https://github.com/cloudfoundry/silk-release/compare/v3.50.0...v3.51.0</a> ## Resources - [Download release 3.51.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.51.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.51.0</a>). </pre>
smb-volume	3.5.0	<p>▼ v3.5.0</p> <pre> ## 3.5.0 **Release Date**: September 26, 2024 ## Changes - Upgrade to Go 1.23! ## Built with go 1.23.1 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.4.0...v3.5.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.4.0...v3.5.0</a> ## Resources - [Download release 3.5.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.5.0">https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.5.0</a>). </pre>
smoke-tests	4.10.0	
syslog	12.3.3	
tanzu-jammy-stack	1.0.1	

## 6.0.8

**Release Date:** 09/27/2024

- **[Bug Fix]** Fixes a bug preventing TCP Routing from working on IST/TASW tiles when the TAS Routing API Endpoint Protocol is configured to be HTTPS only
- Bump bpm to version [1.3.2](#)
- Bump cf-networking to version [3.50.0](#)

- Bump cflinuxfs3 to version 0.407.0
- Bump cf-cli to version 1.67.0
- Bump diego to version 2.103.0
- Bump garden-runc to version 1.56.0
- Bump loggregator-agent to version 8.2.1
- Bump mapfs to version 1.3.0
- Bump nfs-volume to version 7.2.0
- Bump otel-collector to version 0.10.1
- Bump routing to version 0.311.0
- Bump silk to version 3.50.0
- Bump smb-volume to version 3.4.0
- Bump syslog to version 12.3.3

Component	Version	Release Notes
ubuntu-jammy stemcell	1.572	
bpm	1.3.2	

Component	Version	Release Notes
cf-networking	3.50.0	<p>▼ v3.50.0</p> <pre> ## 3.50.0 **Release Date**: September 11, 2024 ## Changes - Bump to golang 1.22.7 - Dependency updates ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.49.0...v3.50.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.49.0...v3.50.0</a> ## Resources - [Download release 3.50.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.50.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.50.0</a>). </pre> <p>▼ v3.49.0</p> <pre> ## 3.49.0 **Release Date**: August 27, 2024 ## Changes - Bumps healthchecker-boshrelease vendored packages ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.48.0...v3.49.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.48.0...v3.49.0</a> ## Resources - [Download release 3.49.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.49.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.49.0</a>). </pre> <p>▼ v3.48.0</p> <pre> ## 3.48.0 **Release Date**: August 20, 2024 ## Changes - Update dependancies ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.47.0...v3.48.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.47.0...v3.48.0</a> ## Resources - [Download release 3.48.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.48.0">https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.48.0</a>). </pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
cflinuxfs3	0.407.0	<p>▼ v0.407.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.407.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.407.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.407.0</a>)</p> </div>
		<p>▼ v0.406.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.406.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.406.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.406.0</a>)</p> </div>
		<p>▼ v0.405.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.405.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.405.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.405.0</a>)</p> </div>
		<p>▼ v0.404.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.404.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.404.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.404.0</a>)</p> </div>
		<p>▼ v0.403.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.403.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.403.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.403.0</a>)</p> </div>
		<p>▼ v0.402.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.402.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.402.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.402.0</a>)</p> </div>
		<p>▼ v0.401.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.401.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.401.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.401.0</a>)</p> </div>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
		<p>▼ v0.400.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.400.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.400.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.400.0</a>)</p> </div> <p>▼ v0.399.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.399.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.399.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.399.0</a>)</p> </div> <p>▼ v0.392.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs3 version 0.392.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.392.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.392.0</a>)</p> </div>
cflinuxfs4	1.107.0	
cf-cli	1.67.0	<p>▼ v1.67.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>### Included CF CLI versions: 7.7.14 8.8.2</pre> </div> <p>▼ v1.66.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>### Included CF CLI versions: 7.7.12 8.8.0</pre> </div>
count-cores-indicator	2.0.0	

Component	Version	Release Notes
diego	2.103.0	<p>▼ v2.103.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## 2.103.0 **Release Date**: September 12, 2024 ## Changes - Go dependency bumps - Remove toolchain directive for compatibility when building binaries ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.102.0...v2.103.0">https://github.com/cloudfoundry/diego-release/compare/v2.102.0...v2.103.0</a> ## Resources - [Download release 2.103.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.103.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.103.0</a>).</pre></div>

Component	Version	Release Notes
garden-runc	1.56.0	<p>▼ v1.56.0</p> <pre> ## 1.56.0 **Release Date**: September 11, 2024 ## Changes - Introduces a new `garden.read_header_timeout` property to configure how long garden's HTTP server will wait to read all HTTP request headers. - Bumps to go 1.22.7 - Dependency Bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/garden-windows/spec b/jobs/garden-windows/spec index 004e4e7f..74f545db 100644 --- a/jobs/garden-windows/spec +++ b/jobs/garden-windows/spec @@ -36,6 +36,10 @@ properties: description: "An array of additional arguments which will be passed to the runtime plugin binary" default: [] + garden.read_header_timeout: + description: "The amount of time allowed to read request headers" + default: 30s + garden.image_plugin: description: "Path to an image plugin binary" diff --git a/jobs/garden/spec b/jobs/garden/spec index 093e53e1..5a78d357 100644 --- a/jobs/garden/spec +++ b/jobs/garden/spec @@ -128,6 +128,10 @@ properties: description: "Path to a runtime plugin binary" default: /var/vcap/packages/runc/bin/runc + garden.read_header_timeout: + description: "The amount of time allowed to read request headers" + default: 30s + garden.no_image_plugin: description: "If true, disables image plugin usage, thus ignoring other image plugin settings" default: false ``` ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.55.0...v1.56.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.55.0...v1.56.0</a> ## Resources - [Download release 1.56.0 from bosh.io](ht </pre>

Component	Version	Release Notes
		<p><a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.56.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.56.0</a>.</p> <p>▼ v1.55.0</p> <pre>## 1.55.0 **Release Date**: August 27, 2024 ## Changes - Bump to golang 1.22.6 ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.54.0...v1.55.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.54.0...v1.55.0</a> ## Resources - [Download release 1.55.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.55.0).</pre>

Component	Version	Release Notes
loggregator-agent	8.2.1	<p>▼ v8.2.1</p> <pre>## What's Changed * Fix loggr-forwarder-agent-windows to emit all OTLP signals by default by @ctlong in https://github.com/cloudfoundry/loggregator-agent-release/pull/611 * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.0...v8.2.1">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.2.0...v8.2.1</a></pre> <p>▼ v8.2.0</p> <pre>## What's Changed * Bump to Golang 1.22.7 * Emit all OTEL signals by default by @mkocher in https://github.com/cloudfoundry/loggregator-agent-release/pull/609 * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.7...v8.2.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.7...v8.2.0</a></pre> <p>▼ v8.1.7</p> <pre>## What's Changed * Bump dependencies * Fix flaky unit tests by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/604 * Ignore linter warnings for G115 by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/607 * Fix uint to int conversion for otelcolclient by @iprotsiuk in https://github.com/cloudfoundry/loggregator-agent-release/pull/608 **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.6...v8.1.7">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.6...v8.1.7</a></pre> <p>▼ v8.1.6</p> <pre>## What's Changed * △ the `temporary_enable_otel_traces` property has been renamed to `enable_otel_traces`. Since this was prefixed as temporary this release is not a major version bump. * Add support to send LOG and EVENT to Otel Collector as logs by @mkocher in https://github.com/cloudfoundry/loggregator-agent-release/pull/603. For backwards compatibility `enable_otel_metrics` is true by default, and `ena</pre>

Component	Version	Release Notes
		<pre>ble_otel_traces` and `enable_otel_logs` are false by default. * Bump dependencies ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/loggregator-agent-release/pull/600">https://github.com/cloudfoundry/loggregator-agent-release/pull/600</a> * @jriguera contributed log support for OTLP forwarding **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.5...v8.1.6">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.5...v8.1.6</a></pre>
mapfs	1.3.0	<p>▼ v1.3.0</p> <pre>## 1.3.0 **Release Date**: September 16, 2024 ## Changes - Mapfs-release has been refactored to remove submodules and localize all documentation ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.2.80...v1.3.0">https://github.com/cloudfoundry/mapfs-release/compare/v1.2.80...v1.3.0</a> ## Resources - [Download release 1.3.0 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.3.0">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.3.0</a>).</pre> <p>▼ v1.2.80</p> <pre>## 1.2.80 **Release Date**: August 27, 2024 ## Changes - Bumped to golang 1.22.6 - Many CI + testing changes/improvements - Dependency bumps ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/mapfs-release/compare/v1.2.79...v1.2.80">https://github.com/cloudfoundry/mapfs-release/compare/v1.2.79...v1.2.80</a> ## Resources - [Download release 1.2.80 from bosh.io] (<a href="https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.2.80">https://bosh.io/releases/github.com/cloudfoundry/mapfs-release?version=1.2.80</a>).</pre>

Component	Version	Release Notes
nfs-volume	7.2.0	<p>▼ v7.2.0</p> <pre> ## 7.2.0 **Release Date**: September 11, 2024 ## Changes - Add dockerdriver-integration errand - Move nfsv3driver and nfsbroker into the release - Bump to go1.22.7 - Update processes to sync with [runtime ci](https://github.com/cloudfoundry/wg-app-platform-runtime-ci) and update release to be on Minor versions - Update bosh blobs to latest - Update ldap test server configuration to have the correct users for tests - Remove support for cf cli v6 ## Bosh Job Spec changes: ``` diff --git a/jobs/dockerdriver-integration/spec b/jobs/dockerdriver-integration/spec new file mode 100644 index 0000000..51e7835 --- /dev/null +++ b/jobs/dockerdriver-integration/spec @@ -0,0 +1,22 @@ +--- +name: dockerdriver-integration + +templates: +  pre-start.erb: bin/pre-start +  run.erb: bin/run +  config.json.erb: config/config.json + +packages: +- dockerdriver-integration +- nfs-debs +- nfsv3driver + + +properties: +  nfs_remote_path: +    description: Address for SMB Remote Path +    default: nfs://nfstestserver.service.c f.internal/export + +  mapfs_path: +    description: "Path to mapfs binary" +    default: /var/vcap/packages/mapfs/bin/ mapfs diff --git a/jobs/nfstestldapserver/spec b/jobs/nfstestldapserver/spec index ec232e3..0408886 100644 --- a/jobs/nfstestldapserver/spec +++ b/jobs/nfstestldapserver/spec @@ -9,7 +9,8 @@ templates: </pre>

Component	Version	Release Notes
		<pre>config/core.ldif: config/core.ldif config/core.schema: config/core.schema config/addou.ldif: config/addou.ldif - config/adduser.ldif: config/adduser.ldif + config/adduser1000.ldif: config/adduser1 000.ldif + config/adduser2000.ldif: config/adduser2 000.ldif helpers/ctl_setup.sh: helpers/ctl_setup.sh helpers/ctl_utils.sh: helpers/ctl_utils.sh slapd.ldif.erb: config/slapd.ldif ``` ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/nfs-volume-release/compare/v7.1.75...v7.2.0">https://github.com/cloudfoundry/nfs-volume-release/compare/v7.1.75...v7.2.0</a> ## Resources - [Download release 7.2.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/nfs-volume-release?version=7.2.0).</pre>

Component	Version	Release Notes
otel-collector	0.10.1	<p>▼ v0.10.1</p> <pre>## What's Changed * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.10.0...v0.10.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.10.0...v0.10.1</a></pre>
		<p>▼ v0.10.0</p> <pre>## What's Changed * Add 'splunk_hec' exporter, 'filter' processor, and 'transform' processor by @mkocher in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/51">https://github.com/cloudfoundry/otel-collector-release/pull/51</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.9.0...v0.10.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.9.0...v0.10.0</a></pre>
		<p>▼ v0.9.0</p> <pre>## What's Changed * feat: Add CPU limit by @aqstack in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/46">https://github.com/cloudfoundry/otel-collector-release/pull/46</a> * fix: config secret interpolation by @acos tall in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/49">https://github.com/cloudfoundry/otel-collector-release/pull/49</a> ## New Contributors * @acos tall made their first contribution in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/49">https://github.com/cloudfoundry/otel-collector-release/pull/49</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.1...v0.9.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.1...v0.9.0</a></pre>
		<p>▼ v0.8.1</p> <pre>## What's Changed * Automatically configure nop pipelines in config when necessary by @iprotsiuk in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/48">https://github.com/cloudfoundry/otel-collector-release/pull/48</a> ## New Contributors * @iprotsiuk made their first contribution in <a href="https://github.com/cloudfoundry/otel-collector-release/pull/48">https://github.com/cloudfoundry/otel-collector-release/pull/48</a> **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.0...v0.8.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.8.0...v0.8.1</a></pre>
		<p>▼ v0.8.0</p>

Component	Version	Release Notes
		<pre>## What's Changed * add integration tests by @mkocher in https://github.com/cloudfoundry/otel-collector-release/pull/45 * Feat: Add secrets property by @ctlong in https://github.com/cloudfoundry/otel-collector-release/pull/47 **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.7.0...v0.8.0</pre>

Component	Version	Release Notes
routing	0.311.0	<p>▼ v0.311.0</p> <pre>## 0.311.0 **Release Date**: September 12, 2024 ## Changes - Fix route-registrar dynamic config YAML field names to match JSON names ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.310.0...v0.311.0">https://github.com/cloudfoundry/routing-release/compare/v0.310.0...v0.311.0</a> ## Resources - [Download release 0.311.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.311.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.311.0</a>).</pre>
		<p>▼ v0.310.0</p> <pre>## 0.310.0 **Release Date**: September 09, 2024 ## Changes - dep: bump gopkg.in/yaml from v2 to v3; adjusted submodules listed in [routing-release#435] (<a href="https://github.com/cloudfoundry/routing-release/pull/435">https://github.com/cloudfoundry/routing-release/pull/435</a>) - minor dependency bumps ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.309.0...v0.310.0">https://github.com/cloudfoundry/routing-release/compare/v0.309.0...v0.310.0</a> ## Resources - [Download release 0.310.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.310.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.310.0</a>).</pre>
		<p>▼ v0.309.0</p> <pre>## 0.309.0 **Release Date**: September 06, 2024 ## Changes - Dependency bumps ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.308.0...v0.309.0">https://github.com/cloudfoundry/routing-release/compare/v0.308.0...v0.309.0</a> ## Resources - [Download release 0.309.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.309.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.309.0</a>).</pre>
		<p>▼ v0.308.0</p>

Component	Version	Release Notes	
		<pre> ## 0.308.0 **Release Date**: September 04, 2024 ## Changes - Route Registrar now allows hosts to be configured per route - By default it will use the top level host config ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.307.0...v0.308.0">https://github.com/cloudfoundry/routing-release/compare/v0.307.0...v0.308.0</a> ## Resources - [Download release 0.308.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.308.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.308.0</a>). </pre>	
	▼ v0.307.0	<pre> ## 0.307.0 **Release Date**: August 27, 2024 ## Changes - Bump healthchecker-boshrelease vendored packages ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.306.0...v0.307.0">https://github.com/cloudfoundry/routing-release/compare/v0.306.0...v0.307.0</a> ## Resources - [Download release 0.307.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.307.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.307.0</a>). </pre>	
	▼ v0.306.0	<pre> ## 0.306.0 **Release Date**: August 26, 2024 ## Changes - Fixes a bug where TCP routes were incorrectly detected as existing records in routing-api when the only difference between the new route and existing record was that the SNI Hostname or TLS TCP Port were different. This resulted in backends for TLS TCP Routes being ignored in certain scenarios. ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.305.0...v0.306.0">https://github.com/cloudfoundry/routing-release/compare/v0.305.0...v0.306.0</a> ## Resources - [Download release 0.306.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.306.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.306.0</a>). </pre>	
	▼ v0.305.0		

Component	Version	Release Notes	
		<pre> ## 0.305.0 **Release Date**: August 23, 2024 ## Changes - Route-registrar can dynamically scan and register routes at paths matching `route_regi strar.dynamic_config_globs` ## Bosh Job Spec changes: ``diff diff --git a/jobs/route_registrar/spec b/jo bs/route_registrar/spec index feafaf10..4f887265 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -94,6 +94,10 @@ properties: route_registrar.routing_api.server_ca_cert: description: "Routing API Certificate Autho rity" + route_registrar.dynamic_config_globs: + description: "Files matching the globs contain routes configuration that will be loa ded dynamically. Parent directory must exist for bpm to mount it." + default: [/var/vcap/jobs/*/config/rout e_registrar/config.yml] + route_registrar.routes: description:   (required, array of objects): Routes that w ill be registered ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/clou dfoundry/routing-release/compare/v0.304.0...v 0.305.0">https://github.com/cloudfoundry/routing-releas e/compare/v0.304.0...v0.305.0</a> ## Resources - [Download release 0.305.0 from bosh.io](h tps://bosh.io/releases/github.com/cloudfound ry/routing-release?version=0.305.0). </pre>	

Component	Version	Release Notes
silk	3.50.0	<p>▼ v3.50.0</p> <pre> ## 3.50.0 **Release Date**: September 11, 2024 ## Changes - Bumps to go 1.22.7 - Dependency bumps - Fixes an issue in vxlan-policy-agent where certain chains were not cleaned up properly - Adjusts how ASG related iptables chain names are generated in vxlan-policy-agent to provide more uniqueness, and better error messaging on collisions. ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.49.0...v3.50.0">https://github.com/cloudfoundry/silk-release/compare/v3.49.0...v3.50.0</a> ## Resources - [Download release 3.50.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.50.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.50.0</a>). </pre>
		<p>▼ v3.49.0</p> <pre> ## 3.49.0 **Release Date**: August 27, 2024 ## Changes - Bumps healthchecker-boshrelease vendored packages ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.48.0...v3.49.0">https://github.com/cloudfoundry/silk-release/compare/v3.48.0...v3.49.0</a> ## Resources - [Download release 3.49.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.49.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.49.0</a>). </pre>
		<p>▼ v3.48.0</p> <pre> ## 3.48.0 **Release Date**: August 20, 2024 ## Changes - Update dependancies ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.47.0...v3.48.0">https://github.com/cloudfoundry/silk-release/compare/v3.47.0...v3.48.0</a> ## Resources - [Download release 3.48.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.48.0">https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.48.0</a>). </pre>

Component	Version	Release Notes

Component	Version	Release Notes
smb-volume	3.4.0	<p>▼ v3.4.0</p> <pre> ## 3.4.0 **Release Date**: September 17, 2024 ## Changes - Add documentation - Removed support for cf cli v6 ## Built with go 1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.2.0...v3.4.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.2.0...v3.4.0</a> ## Resources - [Download release 3.4.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.4.0). </pre> <p>▼ v3.2.0</p> <pre> ## 3.2.0 **Release Date**: August 20, 2024 ## Changes - Added dockerdriver-integration errand - Moved `smbbroker` and `smbdriver` into the release instead of having them as submodule   - Standardize blob name to match garden-running and other releases   - Fixed an error with smbtestserver when it couldn't be deployed twice in a row   - Move config for smbtestserver into the bosh job instead   - Allow consuming username and password for smbtestserver   - Fix a bug with smbtestserver to allow the correct CIDR range for access   - Allow SMB version 3.1.1 for broker since the move to Jammy stemcells [More context](https://learn.microsoft.com/en-us/azure/storage/files/storage-how-to-use-files-linux?tabs=Ubuntu%2Csmbs311)   - Bump to golang 1.22.6   - Update processes to sync with [runtime ci](https://github.com/cloudfoundry/wg-app-platform-runtime-ci) and update release to be on Minor versions ## Bosh Job Spec changes: ``` diff diff --git a/jobs/dockerdriver-integration/spec b/jobs/dockerdriver-integration/spec new file mode 100644 index 000000..a269658 --- /dev/null +++ b/jobs/dockerdriver-integration/spec @@ -0,0 +1,21 @@ +name: dockerdriver-integration + </pre>

Component	Version	Release Notes
		<pre> +templates: +  pre-start.erb: bin/pre-start +  run.erb: bin/run +  config.json.erb: config/config.json + +packages: ++ cifs-utils ++ dockerdriver-integration ++ smbdriver + +consumes: ++ name: smbtestserver +  type: credentials + +properties: +  smb_remote_path: +    description: Address for SMB Remote Path +    default: //smbtestserver.service.cf.internal/vol diff --git a/jobs/smbtestserver/spec b/jobs/smbtestserver/spec index 6e4d88d..de9a091 100755 --- a/jobs/smbtestserver/spec +++ b/jobs/smbtestserver/spec @@ -2,11 +2,19 @@ name: smbtestserver templates: -  install.erb: bin/pre-start +  smb.conf.erb: config/smb.conf +  pre-start.erb: bin/pre-start ctl.erb: bin/smbtestserver_ctl packages: [] +provides: +- name: smbtestserver +  type: credentials +  properties: +    - username +    - password + properties: export_cidr: description: "cidr range to use for smb exports" ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/smb-volume-release/compare/v3.1.74...v3.2.0">https://github.com/cloudfoundry/smb-volume-release/compare/v3.1.74...v3.2.0</a> ## Resources - [Download release 3.2.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/smb-volume-release?version=3.2.0). </pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
syslog	12.3.3	<p>▼ v12.3.3</p> <pre>## What's Changed * Bump packaged Golang to go1.22.7 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.2...v12.3.3">https://github.com/cloudfoundry/syslog-release/compare/v12.3.2...v12.3.3</a></pre> <p>▼ v12.3.2</p> <pre>## What's Changed * Bump packaged Golang to go1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.3.1...v12.3.2">https://github.com/cloudfoundry/syslog-release/compare/v12.3.1...v12.3.2</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.7

Release Date: 08/22/2024



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade Isolation Segment. Failure to upgrade TAS for VMs first will result in TCP route outages on Isolation Segment.

For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- **[Bug Fix]** Fixes known issue [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#)
- Bump bpm to version [1.3.0](#)
- Bump cflinuxfs3 to version [0.391.0](#)
- Bump diego to version [2.102.0](#)
- Bump garden-runc to version [1.54.0](#)
- Bump loggregator-agent to version [8.1.5](#)
- Bump otel-collector to version [0.7.0](#)
- Bump routing to version [0.304.0](#)
- Bump syslog to version [12.3.1](#)

Component	Version	Release Notes
ubuntu-jammy stemcell	1.506	
bpm	1.3.0	
cf-networking	3.47.0	
cflinuxfs3	0.391.0	<p>▼ v0.391.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.391.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.391.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.391.0</a>)</p></div>
cflinuxfs4	1.107.0	
cf-cli	1.65.0	
count-cores-indicator	2.0.0	

Component	Version	Release Notes
diego	2.102.0	<p>▼ v2.102.0</p> <pre> ## 2.102.0 **Release Date**: August 09, 2024 ## Changes - Add TLS support for tcp routes in route-emitter - Split metric_tags from run_info in desired LRP in BBS to minimize database queries issued by convergence ## Bosh Job Spec changes: ``` diff --git a/jobs/route_emitter/spec b/jobs/route_emitter/spec index 11dae3aec..df1b8383c 100644 --- a/jobs/route_emitter/spec +++ b/jobs/route_emitter/spec @@ -112,6 +112,9 @@ properties: tcp.enabled: description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API." default: false + tcp.enable_tls: + description: "When enabled route-emitter will include TLS port and instance GUID when emitting TCP routes." + default: false routing_api.url: description: "Routing API uri to be used by the tcp route-emitter" default: http://routing-api.service.cf.internal diff --git a/jobs/route_emitter_windows/spec b/jobs/route_emitter_windows/spec index cec39c995..9db9e8b69 100644 --- a/jobs/route_emitter_windows/spec +++ b/jobs/route_emitter_windows/spec @@ -112,6 +112,9 @@ properties: tcp.enabled: description: "Enable the route-emitter in cell-local mode to emit TCP routes for instances to the Routing API." default: false + tcp.enable_tls: + description: "When enabled route-emitter will include TLS port and instance GUID when emitting TCP routes." + default: false routing_api.url: description: "Routing API uri to be used by the tcp route-emitter" default: http://routing-api.service.cf.internal ``` ## Built with go 1.22.6 **Full Changelog**: <a 862="" 900="" 952="" 965"="" data-label="Page-Footer" href="https://github.com/clou&lt;/a&gt;&lt;/pre&gt; &lt;/td&gt;&lt;/tr&gt; &lt;/tbody&gt; &lt;/table&gt; &lt;/div&gt; &lt;div data-bbox=">1010</a></pre>

Component	Version	Release Notes
		<pre>dfoundry/diego-release/compare/v2.101.0...v2.102.0 ## Resources - [Download release 2.102.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.102.0).  ▼ v2.101.0  ## 2.101.0 **Release Date**: July 31, 2024 ## Changes - Adds the cnb-app-lifecycle package as a possible app lifecycle for diego. Thanks @pbusk @nicolasbender @modulo11 for this huge effort! - Resolves an issue where CPUWeight could be set to 0 on a container. This value will now always be at least 1, complying with the spec. - Bumped golang to 1.22.5 - Bumped envoy to 1.28.4 - Various testing enhancements ## Bosh Job Spec changes: ```diff diff --git a/jobs/file_server/spec b/jobs/file_server/spec index dddda86c2..f530805b3 100644 --- a/jobs/file_server/spec +++ b/jobs/file_server/spec @@ -20,6 +20,7 @@ packages: - buildpack_app_lifecycle - docker_app_lifecycle - windows_app_lifecycle + - cnb_app_lifecycle provides: - name: file_server ``` ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.100.0...v2.101.0">https://github.com/cloudfoundry/diego-release/compare/v2.100.0...v2.101.0</a> ## Resources - [Download release 2.101.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.101.0).</pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
garden-runc	1.54.0	<p>▼ v1.54.0</p> <pre> ## 1.54.0 **Release Date**: July 31, 2024 ## Changes - Bump to golang 1.22.5 - Bump libnftnl to 1.2.8 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.53...v1.54.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.53...v1.54.0</a> ## Resources - [Download release 1.54.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.54.0). </pre>
loggregator-agent	8.1.5	<p>▼ v8.1.5</p> <pre> ## What's Changed * Bump go dependencies </pre> <p>▼ v8.1.4</p> <pre> ## What's Changed * Bump to Go1.22 by @aqstack in https://github.com/cloudfoundry/loggregator-agent-release/pull/598 * Bump go dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.3...v8.1.4">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.1.3...v8.1.4</a> </pre>
mapfs	1.2.79	
nfs-volume	7.1.75	

Component	Version	Release Notes
otel-collector	0.7.0	<p>▼ v0.7.0</p> <pre>## What's Changed * feat: Add memory limits by @aqstack in https://github.com/cloudfoundry/otel-collector-release/pull/43 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.2...v0.7.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.2...v0.7.0</a></pre> <p>▼ v0.6.2</p> <pre>## What's Changed * Config to allow subset of processors and exporters by @oppegard in https://github.com/cloudfoundry/otel-collector-release/pull/40 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.1...v0.6.2">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.1...v0.6.2</a></pre> <p>▼ v0.6.1</p> <pre>## What's Changed * Move config.yaml and update scripting by @oppegard in https://github.com/cloudfoundry/otel-collector-release/pull/37 * chore: Bump to Go1.22 by @aqstack in https://github.com/cloudfoundry/otel-collector-release/pull/38 ## New Contributors * @oppegard made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/37 * @aqstack made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/38 **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.0...v0.6.1">https://github.com/cloudfoundry/otel-collector-release/compare/v0.6.0...v0.6.1</a></pre>

Component	Version	Release Notes
routing	0.304.0	<p>▼ v0.304.0</p> <pre> ## 0.304.0 **Release Date**: August 13, 2024 ## Changes - Addresses issues with routing-api DB migration logic to fix the following bugs:   - Failed DB migrations would not re-run without manual intervention in the database   - DB migrations could run prior to the active routing-api server receiving code updates   - Failed DB migrations did not result in BOSH deployment failures   - Works around an issue with Gorm + the V6 schema changes for TLS TCP Routing that did not always get applied properly. ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.303.0...v0.304.0">https://github.com/cloudfoundry/routing-release/compare/v0.303.0...v0.304.0</a> ## Resources - [Download release 0.304.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.304.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.304.0</a>).</pre> <p>▼ v0.303.0</p> <pre> ## 0.303.0 **Release Date**: August 09, 2024 ## Changes * add additional unsafe params by @pnikonorcz in <a href="https://github.com/cloudfoundry/routing-release/pull/431">https://github.com/cloudfoundry/routing-release/pull/431</a> ## Bosh Job Spec changes: ```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index de81a0e8..feafaf10 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -132,10 +132,16 @@ properties:   name (required, string): Human-readable reference for the healthcheck   script_path (required, string): Path to script that will be run periodically to determine     service health   + unrestricted_volumes (optional, array of unrestricted_volumes): Additional directories to be mounted in the bpm config for the route_registrar job.   + privileged: (optional, boolean): Sets bpm privileged flag. defaults to false   timeout (optional, string): The healthcheck script must exit within this timeout, otherwi</pre>

Component	Version	Release Notes
		<pre> se the script is terminated with `SIGKILL` and the route is unregistered. Value is a string (e.g. "10s") and must parse to a positive tim e duration i.e. "-5s" is not permitted. Must be less than the value of `registration_inter val`.  Default: Half of the value of `registration _interval` +      unrestricted_volume object +      path (required, string): the path to be mounted +      writable (optional, boolean): sets the writable flag. defaults to false + options object lb_algo (optional, string): Load balancing algorithm for routing incoming requests to th e backend: 'round-robin' or 'least-connectio n'. In cases where this option is not specifi ed, the algorithm defined in gorouter spec is applied. ``` ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.302.0...v0.303.0">https://github.com/cloudfoundry/routing-release/compare/v0.302.0...v0.303.0</a> </pre>

#### ▼ v0.302.0

```

## 0.302.0
**Release Date**: August 08, 2024
## Changes
- Adds drain_wait + load_balancer_healthy_
threshold properties behaving similarly to go
router's to provide better uptime during BOSH
deployments by waiting for LBs to pull nodes
about to be shut down out of service, and re-
add them before moving on to the next.
- Adds support for TLS backends with TCP r
outes. This enables TCP routes to use the env
oy proxy settings on app containers used by H
TTP routes, providing guaranteed TLS encrypti
on between tcp-router + diego-cell VMs, witho
ut intervention from app teams. Additionally
it allows for the disabling of the unproxied
ports on containers since TCP route traffic c
an now go through envoy.
- Fixed a bug with v0.301.0 that caused pr
oblems with TCP routes when a postgres databa
se was used for the routing-api. Thanks for
[finding this] (https://github.com/cloudfoundr
y/routing-api/issues/57) @schmidtsv!
- Bumped to golang 1.22.5
- Bumped tcp_router's haproxy to 2.8.10
- Testing + docs improvements
## Bosh Job Spec changes:

```

Component	Version	Release Notes
		<pre> ``` diff --git a/jobs/tcp_router/spec b/jobs/tcp_router/spec index 44fbb41a..aa6b764c 100644 --- a/jobs/tcp_router/spec +++ b/jobs/tcp_router/spec @@ -10,10 +10,16 @@ templates:   routing_api_client_certificate.crt.erb: config/certs/routing-api/client.crt   routing_api_client_private.key.erb: config/keys/routing-api/client.key   routing_api_ca_certificate.crt.erb: config/certs/routing-api/ca_cert.crt +  tcp_router_backend_client_cert_and_key.pem.erb: config/keys/tcp-router/backend/client_cert_and_key.pem +  tcp_router_backend_ca.crt.erb: config/creds/tcp-router/backend/ca.crt   tcp_router_health_check_certificate.pem.erb: config/certs/health.pem +  # config/haproxy.conf is used for initial haproxy config when starting up   haproxy.conf.erb: config/haproxy.conf -  haproxy.conf.template.erb: config/haproxy.conf.template +  # config/haproxy.conf.template is rendered by tcp-router when routes are provided +  haproxy.conf.template.erb: config/haproxy.conf.template bpm.yml.erb: config/bpm.yml +  drain.erb: bin/drain +  post-start.erb: bin/post-start packages: -  routing_utils @@ -46,6 +52,18 @@ properties:   default: "1m"   tcp_router.oauth_secret:     description: "OAuth client secret used to obtain token for Routing API from UAA." +  tcp_router.backend_tls.enabled: +    description:   +      Turns on support for TLS for TCP Router. Requires tcp_router.backend_tls.ca_cert to +      be set. For mTLS also set tcp_router.backend_tls.client_cert and +      tcp_router.backend_tls.client_key. +    default: false +  tcp_router.backend_tls.client_cert: +    description: "TCP Router's TLS client cert used for mTLS with route backends" +  tcp_router.backend_tls.client_key: +    description: "TCP Router's TLS client private key used for mTLS with route backends" +  tcp_router.backend_tls.ca_cert: +    description: "TCP Router's TLS CA used </pre>

Component	Version	Release Notes
		<pre> with route backends"   routing_api.uri:     description: "URL where the routing API can be reached internally"     @@ -86,6 +104,19 @@ properties:       description: "Fail the tcp router if routin g_api.reserved_system_component_ports conflic t with ports in existing router groups."       default: "false"       +  tcp_router.drain_wait:         +  description:             +    Delay in seconds after shut down is initiated before haproxy stops listening.           +    During this time haproxy will reject requests to the /health endpoint.           +    This accommodates requests forwarded by a load balancer until it considers the tcp _router unhealthy.           +    default: 20           +  tcp_router.load_balancer_healthy_thresho ld:           +  description:               +    Time period in seconds to wait until declaring the tcp_router instance             +    started after starting the listener socket. This allows an external load             +    balancer time to register the instan ce as healthy."           +    default: 20           +           uaa.token_endpoint:             description: "UAA token endpoint host name. Do not include a scheme in this value; TCP Ro uter will always use TLS to connect to UAA."             default: uaa.service.cf.internal             ```  ## Built with go 1.22.6 **Full Changelog**: <a href="https://github.com/clou dfoundry/routing-release/compare/v0.301.0...v 0.302.0">https://github.com/cloudfoundry/routing-release/compare/v0.301.0...v0.302.0</a> ## Resources - [Download release 0.302.0 from bosh.io](h <a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.302.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.302.0</a>). </pre>
silk	3.47.0	
smb-volume	3.1.74	
smoke-tests	4.10.0	

Component	Version	Release Notes
syslog	12.3.1	<p>▼ v12.3.1</p> <pre>## What's Changed * Bump packaged Golang to go1.22.5 **Full Changelog**: <a href="https://github.com/clooudfoundry/syslog-release/compare/v12.3.0...v12.3.1">https://github.com/clooudfoundry/syslog-release/compare/v12.3.0...v12.3.1</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.6

**Release Date:** 07/29/2024



### Caution

This release is affected by a known issue for customers who use both Postgres for the TAS for VMs database and TCP Routes. Users who use both Postgres and TCP Routes should not upgrade to this version. This only applies if Postgres is used for the core Cloud Foundry databases, not if apps use Postgres services.



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade Isolation Segment. Failure to upgrade TAS for VMs first will result in TCP route outages on Isolation Segment.

For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- **[Bug Fix]** Resolves a rare issue leading to pre-start script failures in the garden-cni + vxlan-policy-agent jobs on diego-cells
- **[Bug Fix]** Adds 2 minute caching for failed dns lookups in syslog agent to avoid dns load for malformed drain urls.
- **[Feature]** Adds `PrometheusRemoteWrite` exporter and `batch` processor.
- Bump bpm to version [1.2.23](#)
- Bump cf-networking to version [3.47.0](#)
- Bump cflinuxfs4 to version [1.107.0](#)
- Bump cf-cli to version [1.65.0](#)
- Bump loggregator-agent to version [8.1.3](#)
- Bump nfs-volume to version [7.1.75](#)
- Bump otel-collector to version [0.6.0](#)

- Bump silk to version 3.47.0
- Bump smb-volume to version 3.1.74

Component	Version	Release Notes
ubuntu-jammy stemcell	1.486	
bpm	1.2.23	
cf-networking	3.47.0	<p>▼ v3.47.0</p> <pre> ## 3.47.0 **Release Date**: July 19, 2024 ## Changes - Fixed a bug in the pre-start script of g arden-cni that deleted the iptables.lock file + directory unnecessarily, causing issues wit h the vxlan-policy-agent pre-start script - Refactored polling logic in policy-server - Bump to go 1.22.5 ## Built with go 1.22.5 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.46.0...v3.47.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.46.0...v3.47.0</a> ## Resources - [Download release 3.47.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/cf-networking-release?version=3.47.0). </pre>
cflinuxfs3	0.390.0	

Component	Version	Release Notes
cflinuxfs4	1.107.0	<p>▼ v1.107.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.107.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.107.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.107.0</a>)</p> </div> <p>▼ v1.106.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.106.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.106.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.106.0</a>)</p> </div> <p>▼ v1.105.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.105.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.105.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.105.0</a>)</p> </div> <p>▼ v1.104.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.104.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.104.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.104.0</a>)</p> </div>
cf-cli	1.65.0	<p>▼ v1.65.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>### Included CF CLI versions: 7.7.11 8.7.11</pre> </div>
count-cores-indicator	2.0.0	
diego	2.100.0	
garden-runc	1.53.0	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
loggregator-agent	8.1.3	<p>▼ v8.1.3</p> <pre>## What's Changed * Cache failed dns lookups for 120 seconds which reduced load on DNS system when invalid drains are present by @acostall in https://gi thub.com/cloudfoundry/loggregator-agent-relea se/pull/596 **Full Changelog**: https://github.com/clou dfoundry/loggregator-agent-release/compare/v 8.1.2...v8.1.3</pre> <p>▼ v8.1.2</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.12 **Full Changelog**: https://github.com/clou dfoundry/loggregator-agent-release/compare/v 8.1.1...v8.1.2</pre>
mapfs	1.2.79	
nfs-volume	7.1.75	<p>▼ v7.1.75</p> <pre>## Changes ## Dependencies * **nfsv3driver:** Updated to v`44424a7`. For more information, see [nfsv3driver] (http s://github.com/cloudfoundry/nfsv3driver).</pre>

Component	Version	Release Notes
otel-collector	0.6.0	<p>▼ v0.6.0</p> <pre> ## What's Changed * Expose wider collector configuration by @acrmp in https://github.com/cloudfoundry/otel-collector-release/pull/31. This allows for configuring processors, pipelines &amp; exporters which provides a lot more flexibility to platform engineers. * Add PrometheusRemoteWrite Exporter by @benjaminguettmann-avtq in https://github.com/cloudfoundry/otel-collector-release/pull/26 * Add batch processor by @acrmp in https://github.com/cloudfoundry/otel-collector-release/pull/32 * Bump go.opentelemetry.io/collector/cmd/builder from 0.103.0 to 0.104.0 in /src/otel-collector-builder by @dependabot in https://github.com/cloudfoundry/otel-collector-release/pull/30  ## New Contributors * @benjaminguettmann-avtq made their first contribution in https://github.com/cloudfoundry/otel-collector-release/pull/26 **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.5...v0.6.0 </pre>
routing	0.301.0	
silk	3.47.0	<p>▼ v3.47.0</p> <pre> ## 3.47.0 **Release Date**: July 19, 2024 ## Changes - Fixed a race condition in the pre-start script of vxlan-policy-agent that would cause failures if the iptables.lock file's directory was deleted by another process while the pre-start was obtaining a lock. - Updated go-loggregator usage to v9 - Refactored polling logic of vxlan-policy-agent and silk-daemon - Bump to go 1.22.5 ## Built with go 1.22.5 **Full Changelog**: https://github.com/cloudfoundry/silk-release/compare/v3.46.0...v3.47.0 ## Resources - [Download release 3.47.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.47.0). </pre>

Component	Version	Release Notes
smb-volume	3.1.74	<p>▼ v3.1.74</p> <div style="border: 1px solid #ccc; padding: 5px;">           ## Changes            * Golang: Updated to v1.22.5 (#428)         </div>
smoke-tests	4.10.0	
syslog	12.3.0	
tanzu-jammy-stack	1.0.1	

## 6.0.5

**Release Date:** 07/08/2024



### Caution

This release is affected by a known issue for customers who use both Postgres for the TAS for VMs database and TCP Routes. Users who use both Postgres and TCP Routes should not upgrade to this version. This only applies if Postgres is used for the core Cloud Foundry databases, not if apps use Postgres services.



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade Isolation Segment. Failure to upgrade TAS for VMs first will result in TCP route outages on Isolation Segment.

For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

- **[Bug Fix]** Route Registrar only sends 5 unregistration messages in a row when a route becomes unhealthy. This prevents Gorouter's logs from filling up with unnecessary, repetitive log messages.
- Bump bpm to version [1.2.22](#)
- Bump cflinuxfs3 to version [0.390.0](#)
- Bump cflinuxfs4 to version [1.103.0](#)
- Bump cf-cli to version [1.64.0](#)
- Bump diego to version [2.100.0](#)
- Bump mapfs to version [1.2.79](#)
- Bump nfs-volume to version [7.1.74](#)
- Bump otel-collector to version [0.5.0](#)
- Bump routing to version [0.301.0](#)

- Bump smb-volume to version 3.1.73
- Bump syslog to version 12.3.0

Component	Version	Release Notes
ubuntu-jammy stemcell	1.486	
bpm	1.2.22	
cf-networking	3.46.0	
cflinuxfs3	0.390.0	<p>▼ v0.390.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.390.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.390.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.390.0</a>)</p></div> <p>▼ v0.389.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.389.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.389.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.389.0</a>)</p></div> <p>▼ v0.388.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs3 version 0.388.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.388.0">https://github.com/cloudfoundry/cflinuxfs3/releases/tag/0.388.0</a>)</p></div>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
cflinuxfs4	1.103.0	<p>▼ v1.103.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.103.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.103.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.103.0</a>)</p> </div>
		<p>▼ v1.102.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.102.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.102.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.102.0</a>)</p> </div>
		<p>▼ v1.101.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.101.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.101.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.101.0</a>)</p> </div>
		<p>▼ v1.100.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.100.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.100.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.100.0</a>)</p> </div>
		<p>▼ v1.99.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.99.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.99.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.99.0</a>)</p> </div>
		<p>▼ v1.98.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.98.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.98.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.98.0</a>)</p> </div>
		<p>▼ v1.97.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.97.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.97.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.97.0</a>)</p> </div>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
		<p>▼ v1.96.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.96.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.96.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.96.0</a>)</p> </div> <p>▼ v1.95.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.95.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.95.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.95.0</a>)</p> </div> <p>▼ v1.94.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.94.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.94.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.94.0</a>)</p> </div> <p>▼ v1.93.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.93.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.93.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.93.0</a>)</p> </div> <p>▼ v1.92.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.92.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.92.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.92.0</a>)</p> </div>
cf-cli	1.64.0	<p>▼ v1.64.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>### Included CF CLI versions: 7.7.10 8.7.10</pre> </div>
count-cores-indicator	2.0.0	

Component	Version	Release Notes
diego	2.100.0	<p>▼ v2.100.0</p> <pre> ## Changes - Bumped loggregator usage to loggregator v 9 - Thanks @Birdrock! - Bumped cfhttp usage to cfhttp v2 - Thanks @jrussett ! - Bumped go dependency bumps ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.99.0...v2.100.0">https://github.com/cloudfoundry/diego-release/compare/v2.99.0...v2.100.0</a> ## Resources - [Download release 2.100.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.100.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.100.0</a>). </pre>
garden-runc	1.53.0	
loggregator-agent	8.1.1	
mapfs	1.2.79	<p>▼ v1.2.79</p> <pre> ## Changes * Add final release 1.2.72 [ci skip] * Golang: Updated to v1.22.4 (#269) * bump mapfs ## Dependencies * **v2:** Updated to v2.19.0. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **mapfs:** Updated to v`756bafb`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>). </pre> <p>▼ v1.2.72</p> <pre> ## Changes * Add final release 1.2.71 [ci skip] * Bump mapfs (#263) ## Dependencies * **mapfs:** Updated to v`ac01341`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>). </pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
nfs-volume	7.1.74	<p>▼ v7.1.74</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Golang: Updated to v1.22.4 (#963)</pre> </div> <p>▼ v7.1.73</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Add final release 7.1.72 [ci skip] * Use cf create update-service-broker to register the service (#972) * Bump openssl- from 3.3.0 to 3.3.1 (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/959">https://github.com/cloudfoundry/nfs-volume-release/pull/959</a>) * Golang: Updated to v1.22.4 (<a href="https://github.com/cloudfoundry/nfs-volume-release/pull/962">https://github.com/cloudfoundry/nfs-volume-release/pull/962</a>)</pre> </div> <p>▼ v7.1.72</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Add final release 7.1.71 [ci skip] * Bump openssl- from 3.3.0 to 3.3.1 (#959) * Golang: Updated to v1.22.4 (#962)</pre> </div> <p>▼ v7.1.71</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes ## Dependencies * **nfsbroker:** Updated to v`b8a1e4c`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>).</pre> </div> <p>▼ v7.1.68</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>## Changes * Add final release 7.1.66 [ci skip] * Bump submodules (#938) ## Dependencies * **nfsbroker:** Updated to v`eld14e4`. For more information, see [nfsbroker] (<a href="https://github.com/cloudfoundry/nfsbroker">https://github.com/cloudfoundry/nfsbroker</a>).</pre> </div>

Component	Version	Release Notes
otel-collector	0.5.0	<p>▼ v0.5.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><pre>## What's Changed * Bump otel-collector to v0.103.0 in https://github.com/cloudfoundry/otel-collector-release/pull/28.   * If you have configured exporters to use persistent queues note that [re-enqueuing of failed batches has been removed] (<a href="https://github.com/open-telemetry/opentelemetry-collector/releases/tag/v0.92.0">https://github.com/open-telemetry/opentelemetry-collector/releases/tag/v0.92.0</a>).   * Bump to [go1.21.11] (<a href="https://groups.google.com/g/golang-announce/c/XbxouI9gY7k/m/TuoGEhxIEwAJ">https://groups.google.com/g/golang-announce/c/XbxouI9gY7k/m/TuoGEhxIEwAJ</a>). **Full Changelog**: <a href="https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.1...v0.5.0">https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.1...v0.5.0</a></pre></div>

Component	Version	Release Notes
routing	0.301.0	<p>▼ v0.301.0</p> <pre> ## Changes - Fixes a bug introduced in [v0.298.0](https://github.com/cloudfoundry/routing-release/releases/tag/v0.298.0) where the `X-Forwarded-Host` header was incorrectly set for requests containing an `Expect: 100-continue` header. Thanks @maxmoehl ! ## Built with go 1.22.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.300.0...v0.301.0">https://github.com/cloudfoundry/routing-release/compare/v0.300.0...v0.301.0</a> ## Resources - [Download release 0.301.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.301.0). </pre>
		<p>▼ v0.300.0</p> <pre> ## Changes - Update route registrar to only send 5 unregistration messages for an unhealthy route - https://github.com/cloudfoundry/route-registrar/pull/46 . Thanks @andy-a-d-nguyen for your first contribution to CF! ## Built with go 1.22.4 ## Resources - [Download release 0.300.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.300.0). **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.299.0...v0.300.0">https://github.com/cloudfoundry/routing-release/compare/v0.299.0...v0.300.0</a> </pre>
		<p>▼ v0.299.0</p> <pre> ## Changes - Bumped to Golang 1.22.4 - Added ability to enforce strict validation of route service signature. Thanks @maxmoehl, @bltamara and @plowin ! ## Bosh Job Spec changes: ```diff diff --git a/jobs/gorouter/spec b/jobs/gorouter/spec index 8269440b..60c7b520 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -262,6 +262,9 @@ properties:    router.route_services_timeout:      description: "Expiry time of a route service signature in seconds"      default: 60 ``` </pre>

Component	Version	Release Notes
		<pre> +   router.route_services_strict_signature_validation: +     description: "Enforce strict validation of a route service signature" +     default: false router.max_header_kb: description:     This value controls the maximum number of bytes (in KB) the gorouter will read ``` ## Built with go 1.22.4 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.298.0...v0.299.0">https://github.com/cloudfoundry/routing-release/compare/v0.298.0...v0.299.0</a> ## Resources - [Download release 0.299.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.299.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.299.0</a>). </pre>
silk	3.46.0	

Component	Version	Release Notes
smb-volume	3.1.73	<p>▼ v3.1.73</p> <pre>## Changes ## Dependencies * **smbdriver:** Updated to v`9ec4dc3`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.72</p> <pre>## Changes * Bump smbdriver (#414) * Golang: Updated to v1.22.4 (#422) * Use cf create update-service-broker to register the service (#424) ## Dependencies * **v2:** Updated to v2.19.0. For more information, see [v2](https://github.com/onsi/ginkgo). * **smbdriver:** Updated to v`4b6cce2`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.69</p> <pre>## Changes * Add final release 3.1.68 [ci skip] ## Dependencies * **smbbroker:** Updated to v`da19354`. For more information, see [smbbroker](http://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`6a0de14`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver).</pre>
smoke-tests	4.10.0	

Component	Version	Release Notes
syslog	12.3.0	<p>▼ v12.3.0</p> <pre> ## What's Changed ### Features * Use service command to restart rsyslog, enabling BOSH Lite deployment by @ohkyle in https://github.com/cloudfoundry/syslog-release/pull/178 ### Maintenance * Bump blackbox dependencies * Bump packaged Golang to go1.21.11 ### New Contributors * @ohkyle made their first contribution in https://github.com/cloudfoundry/syslog-release/pull/178 **Full Changelog**: https://github.com/cloudfoundry/syslog-release/compare/v12.2.5...v12.3.0 </pre>
tanzu-jammy-stack	1.0.1	

## 6.0.4

**Release Date:** 05/29/2024

- **[Bug Fix]** Remove replication-canary
- **[Bug fix]** Automatically restart Route Emitter after multiple failed attempts to greet Gorouter. This fixes a [rare bug](#) that prevented Route Emitter from being able to register routes.
- Bump bpm to version [1.2.19](#)
- Bump cflinuxfs4 to version [1.91.0](#)
- Bump diego to version [2.99.0](#)
- Bump garden-runc to version [1.53.0](#)
- Bump mapfs to version [1.2.70](#)
- Bump nfs-volume to version [7.1.66](#)
- Bump routing to version [0.298.0](#)
- Bump smb-volume to version [3.1.68](#)

Component	Version	Release Notes
ubuntu-jammy stemcell	1.445	
bpm	1.2.19	
cf-networking	3.46.0	
cflinuxfs3	0.387.0	

Component	Version	Release Notes
cflinuxfs4	1.91.0	<p>▼ v1.91.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.91.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.91.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.91.0</a>)</p></div> <p>▼ v1.90.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.90.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.90.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.90.0</a>)</p></div> <p>▼ v1.89.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.89.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.89.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.89.0</a>)</p></div> <p>▼ v1.88.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.88.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.88.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.88.0</a>)</p></div> <p>▼ v1.87.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.87.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.87.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.87.0</a>)</p></div> <p>▼ v1.86.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.86.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.86.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.86.0</a>)</p></div> <p>▼ v1.85.0</p> <div style="border: 1px solid #ccc; padding: 10px;"><p>This release ships with cflinuxfs4 version 1.85.0. For more information, see the [release notes] (<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.85.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.85.0</a>)</p></div>

Component	Version	Release Notes
		<p>▼ v1.84.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.84.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.84.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.84.0</a>)</p> </div> <p>▼ v1.83.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>This release ships with cflinuxfs4 version 1.83.0. For more information, see the [release notes](<a href="https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.83.0">https://github.com/cloudfoundry/cflinuxfs4/releases/tag/1.83.0</a>)</p> </div>
cf-cli	1.60.0	
count-cores-indicator	2.0.0	
diego	2.99.0	<p>▼ v2.99.0</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre> ## Changes - Do not remove evacuating actual LRP during cleanup ([rep#53](<a href="https://github.com/cloudfoundry/rep/pull/53">https://github.com/cloudfoundry/rep/pull/53</a>)) - Add additional retries when apps make use of credhub for credentials. ([buildpackapplifecycle#71](<a href="https://github.com/cloudfoundry/buildpackapplifecycle/pull/71">https://github.com/cloudfoundry/buildpackapplifecycle/pull/71</a>)) - Prevent panics in BBS by checking for all types of errors ([bbs#95](<a href="https://github.com/cloudfoundry/bbs/pull/95">https://github.com/cloudfoundry/bbs/pull/95</a>)) - Add retry logic and more explicit failure in router emitter start-up ([router-emitter#34](<a href="https://github.com/cloudfoundry/route-emitter/pull/34">https://github.com/cloudfoundry/route-emitter/pull/34</a>)) - Bump envoy blob version to `1.28.3` - Go mod dependency bumps ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.98.0...v2.99.0">https://github.com/cloudfoundry/diego-release/compare/v2.98.0...v2.99.0</a> ## Resources - [Download release 2.99.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.99.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.99.0</a>). </pre> </div>

Component	Version	Release Notes
garden-runc	1.53.0	<p>▼ v1.53.0</p> <pre> ## Changes - **DEPRECATION NOTICE** The `garden.experimental_use_containerd_mode_for_processes` property and usage of Garden when run in containerd mode for processes is now deprecated and no longer tested. - **DEFAULT CHANGE** - The default mode for garden containers is now containerd. This has been the default in cf-deployment since 2018. - **REMOVAL OF EXPERIMENTAL FUNCTIONALITY NOTICE** The experimental option to run the garden server process in rootless mode has been removed, as it did not work as expected and was an abandoned feature. - Go package dependency bumps ## Bosh Job Spec changes: ```diff diff --git a/jobs/garden-binaries/spec b/jobs/garden-binaries/spec index 0433639a..a8a96bae 100644 --- a/jobs/garden-binaries/spec +++ b/jobs/garden-binaries/spec @@ -15,7 +15,6 @@ packages: - grootfs - xfs-progs - thresholder - - netplugin-shim - dontpanic - tini diff --git a/jobs/garden/spec b/jobs/garden/spec index 027df351..093e53e1 100644 --- a/jobs/garden/spec +++ b/jobs/garden/spec @@ -36,7 +36,6 @@ packages: - grootfs - xfs-progs - thresholder - - netplugin-shim - dontpanic - tini @@ -199,10 +198,6 @@ properties: description: AppArmor profile to use for unprivileged container processes default: garden-default - garden.experimental_rootless_mode: -   description: A boolean stating whether or not to run garden-server as a non-root user -   default: false - # We believe this defaults to false to help concourse: https://github.com/cloudfoundry/garden-runc-release/releases/tag/v1.5.0 </pre>

Component	Version	Release Notes
		<pre> # For diego/cf, this should be set to true garden.cleanup_process_dirs_on_wait: @@ -210,8 +205,8 @@ properties:   default: false   garden.containerd_mode:     - description: "Use containerd for container lifecycle management. NOTE: cannot be used in combination with bpm or rootless"       - default: false       + description: "Use containerd for container lifecycle management. NOTE: cannot be used in combination with bpm"         + default: true         garden.tcp_keepalive_time:           description: Sets the `net.ipv4.tcp_keepalive_time` kernel parameter in containers. If not specified, the value from the linux init_net namespace is used.           @@ -229,7 +224,7 @@ properties:             description: Sets the `net.ipv4.tcp_retries2` kernel parameter in containers. If not specified, the value from the linux init_net namespace is used.             garden.experimental_use_containerd_mode_for_processes:               - description: "(Under development) Use containerd for container process management. Must be used with containerd_mode also set to true. NOTE: cannot be used in combination with bpm or rootless"                 + description: "(Deprecated) No longer used/tested."                 default: false                 garden.experimental_cpu_throttling:                   diff --git a/jobs/gats/spec b/jobs/gats/spec                   c                   index 916a35eb..065e3ace 100644                   --- a/jobs/gats/spec                   +++ b/jobs/gats/spec                   @@ -22,12 +22,6 @@ properties:                     garden_test_rootfs:                       description: Test rootfs to use                       default: 'docker:///cloudfoundry/garden-rootfs'                     - containerd_for_processes:                       - description: Run GATS with CONTAINERD_FOR_PROCESSES_ENABLED                         - default: false                         - rootless:                           - description: Run GATS with ROOTLESS enabled                             - default: false                             cpu_throttling:                               description: Run GATS with CPU_THROTTLING_ENABLED                               default: false                             ... ``` </pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
		<pre>## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.52.0...v1.53.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.52.0...v1.53.0</a> ## Resources - [Download release 1.53.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.53.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.53.0</a>).</pre>
loggregator-agent	8.1.1	
mapfs	1.2.70	<p>▼ v1.2.70</p> <pre>## Changes * Golang: Updated to v1.22.3. (#259) ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **mapfs:** Updated to v`0de16f2`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> <p>▼ v1.2.69</p> <pre>## Dependencies * **v2:** Updated to v2.17.2. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **gomega:** Updated to v1.33.1. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>). * **mapfs:** Updated to v`7f382bc`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre>

Component	Version	Release Notes
nfs-volume	7.1.66	<p>▼ v7.1.66</p> <pre> ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2] (https://github.com/onsi/ginkgo). * **nfsbroker:** Updated to v`90964d1`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`4d13326`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre> <p>▼ v7.1.65</p> <pre> ## Changes * Golang: Updated to v1.22.3 (#920) * Bump util-linux from 2.40 to 2.40.1 (#922) * Change nfsv3driver statd default port to `41793` (non-ephemeral) (#909) * Use newest cf-cli available (#913) ## Dependencies * **nfsbroker:** Updated to v`071d3d8`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`49ad37b`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre> <p>▼ v7.1.64</p> <pre> ## Dependencies * **gomega:** Updated to v1.33.1. For more information, see [gomega] (https://github.com/onsi/gomega). * **nfsbroker:** Updated to v`33b1b44`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`2e98b36`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre>
otel-collector	0.4.1	

Component	Version	Release Notes
routing	0.298.0	<p>▼ v0.298.0</p> <pre> ## Changes - :bug: Improve support for requests using the Expect: 100-continue header. - :bug: The missing_content_length_header m etric introduced in 0.297.0 has been renamed to empty_content_length_header for more accur acy. Thanks @peanball! - :bug: The empty_content_length_header was fixed to more accurately capture events when the content-length header of a request was em pty. Previously extra request types were bein g included erroneously. ## Bosh Job Spec changes: ``diff diff --git a/jobs/gorouter/spec b/jobs/goro uter/spec index 712a761f..8269440b 100644 --- a/jobs/gorouter/spec +++ b/jobs/gorouter/spec @@ -306,6 +306,9 @@ properties: router.keep_alive_probe_interval: default: 1s description: Interval between TCP keep aliv e probes. Value is a string (e.g. "10s") + router.keep_alive_100_continue_requests: +   description: "If set gorouter reuses b ackend connection for requests expecting 100- Continue" +   default: false router.force_forwarded_proto_https: description: "Enables setting X-Forwarded-P roto header if SSL termination happened upstr eam and incorrectly set the header value. Whe n this property is set to true gorouter sets the header X-Forwarded-Proto to https. When t his value set to false, gorouter set the head er X-Forwarded-Proto to the protocol of the i ncoming request" default: false ``` ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.297.0...v0.298.0">https://github.com/cloudfoundry/routing-release/compare/v0.297.0...v0.298.0</a> ## Resources - [Download release 0.298.0 from bosh.io](h tps://bosh.io/releases/github.com/cloudfound ry/routing-release?version=0.298.0). </pre> <p>▼ v0.297.0</p> <pre> ## Changes - ** FIXES KNOWN ISSUE** Gorouter now corre ctly returns the status code provided by back </pre>

Component	Version	Release Notes
		<p>ends for workflows using 100-continue, or other 1xx interim status codes. Thanks for catching this @plowin @domdom82 and thanks @geofffranks for the quick fix!</p> <ul style="list-style-type: none"> <li>- The TLS listener for the health status endpoint in gorouter now handles custom cipher-suites that do not include any of the required HTTP/2 ciphers. Thanks @MarcPaquette + @geofffranks!</li> <li>- Failing to establish a TCP connection to a backend no longer causes a panic when setting up a WebSocket connection. Thanks @domdom82!</li> <li>- The health status endpoint for gorouter is now able to log error messages encountered when it starts up, to aid in troubleshooting. Thanks @MarcPaquette and @geofffranks !</li> <li>- Gorouter now provides a `missing_content_length_header` metric that will flag requests that would have been hit by Golang 1.22's new check to reject requests that have an empty content-length header. This can be used to determine if an environment will be affected by disabling the `go.http.alxcontentlength` gorouter property. Thanks @mariash!</li> <li>- **NOTE:** The metric is counting requests unaffected by the new golang behavior and will be updated in 0.298.0+, where it is also renamed to `empty_content_length_header`.</li> <li>- Route registrar now allows operators to specify load balancing algorithms for individual routes. Thanks @b1tamara and @domdom82 !</li> <li>- Bumped to golang 1.22.3</li> <li>## Bosh Job Spec changes:</li> <pre>```diff diff --git a/jobs/route_registrar/spec b/jobs/route_registrar/spec index c51dbb9f..de81a0e8 100644 --- a/jobs/route_registrar/spec +++ b/jobs/route_registrar/spec @@ -125,7 +125,8 @@ properties: with error, the route is unregistered. router_group (required, string, for tcp routes): Name of the router group to which the TCP route should be added. external_port (required, string, for tcp routes): Port that the TCP router will listen on. -           server_cert_domain_name_modifier (optional, string, for sni routes): a regex replace to help with complicated hostnames +           server_cert_domain_name_modifier (optional, string, for sni routes): a regex replace to help with complicated hostnames. +           options (optional, object, for http routes): Custom per-route options health_check object</pre> </ul>

Component	Version	Release Notes
		<pre> name (required, string): Human-readable reference for the healthcheck @@ -135,6 +136,9 @@ properties: the script is terminated with `SIGKILL` and the route is unregistered. Value is a string (e.g. "10s") and must parse to a positive time duration i.e. "-5s" is not permitted. Must be less than the value of `registration_interval`.  Default: Half of the value of `registration_interval` + options object + lb_algo (optional, string): Load balancing algorithm for routing incoming requests to the backend: 'round-robin' or 'least-connection'. In cases where this option is not specified, the algorithm defined in gorouter spec is applied.  + example:   - name: my-service uris: @@ -150,6 +154,8 @@ properties: script_path: /path/to/script timeout: 5s route_service_url: https://my-oauth-proxy-route-service.example.com + options: + lb_algo: least-connection - name: my-tls-endpoint tls_port: 12346 server_cert_domain_san: "my-tls-endpoint.internal.com" ``` ## Built with go 1.22.3 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.296.0...v0.297.0">https://github.com/cloudfoundry/routing-release/compare/v0.296.0...v0.297.0</a> ## Resources - [Download release 0.297.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.297.0).</pre>
silk	3.46.0	

Component	Version	Release Notes
smb-volume	3.1.68	<p>▼ v3.1.68</p> <pre> ## Changes * Golang: Updated to v1.22.3 (#408) ## Dependencies * **v2:** Updated to v2.17.3. For more information, see [v2](https://github.com/onsi/ginkgo). * **smbbroker:** Updated to v`17a844f`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`9ccf77c`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver). </pre> <p>▼ v3.1.67</p> <pre> ## Changes * Use newest cf-cli available (#405) ## Dependencies * **v2:** Updated to v2.17.2. For more information, see [v2](https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.33.1. For more information, see [gomega](https://github.com/onsi/gomega). * **smbbroker:** Updated to v`490615c`. For more information, see [smbbroker](https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`fa2b5d0`. For more information, see [smbdriver](https://github.com/cloudfoundry/smbdriver). </pre>
smoke-tests	4.10.0	
syslog	12.2.5	
tanzu-jammy-stack	1.0.1	

## 6.0.3

**Release Date:** 05/03/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue](#).

- Bump loggregator-agent to version 8.1.1

Component	Version	Release Notes
ubuntu-jammy stemcell	1.423	
bpm	1.2.18	
cf-networking	3.46.0	
cflinuxfs3	0.387.0	
cflinuxfs4	1.82.0	
cf-cli	1.60.0	
count-cores-indicator	2.0.0	
diego	2.98.0	
garden-runc	1.52.0	
loggregator-agent	8.1.1	<p>▼ v8.1.1</p> <pre>## What's Changed * Bump dependencies * Fix Syslog Binding Cache polling to wait for the entire polling interval between each operation in https://github.com/cloudfoundry/ loggregator-agent-release/pull/572 **Full Changelog**: https://github.com/cloudfoundry/loggregator-agent-release/compare/v 8.1.0...v8.1.1</pre>
maps	1.2.68	
nfs-volume	7.1.63	
otel-collector	0.4.1	
routing	0.296.0	
silk	3.46.0	
smb-volume	3.1.66	
smoke-tests	4.10.0	
syslog	12.2.5	
tanzu-jammy-stack	1.0.1	

## 6.0.2

Release Date: 05/01/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To

resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue.](#)

- Bump cf-networking to version [3.46.0](#)
- Bump diego to version [2.98.0](#)
- Bump garden-runc to version [1.52.0](#)
- Bump loggregator-agent to version [8.1.0](#)
- Bump mapfs to version [1.2.68](#)
- Bump nfs-volume to version [7.1.63](#)
- Bump routing to version [0.296.0](#)
- Bump silk to version [3.46.0](#)
- Bump smb-volume to version [3.1.66](#)
- Bump syslog to version [12.2.5](#)

Component	Version	Release Notes
ubuntu-jammy stemcell	1.423	
bpm	1.2.18	
cf-networking	3.46.0	<p>▼ v3.46.0</p> <pre> ## Changes - Bump Golang to 1.22 ## Bosh Job Spec changes: ```diff diff --git a/jobs/performance-test-sd/spec b/jobs/performance-test-sd/spec index c89d50f5..0583340e 100644 --- a/jobs/performance-test-sd/spec +++ b/jobs/performance-test-sd/spec @@ -6,7 +6,7 @@ templates: config.json.erb: config.json packages: - - golang-1.21-linux + - golang-1.22-linux - performance-test-sd consumes: ``` ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.45.0...v3.46.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.45.0...v3.46.0</a> ## Resources - [Download release 3.46.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.46.0). </pre>
cflinuxfs3	0.387.0	

Component	Version	Release Notes
cflinuxfs4	1.82.0	
cf-cli	1.60.0	
count-cores-indicator	2.0.0	
diego	2.98.0	<p>▼ v2.98.0</p> <pre> ## Changes - Update Golang to 1.22 ## Bosh Job Spec changes: ```diff diff --git a/jobs/vizzini/spec b/jobs/vizzini/spec index 7eb920159..d61278357 100644 --- a/jobs/vizzini/spec +++ b/jobs/vizzini/spec @@ -1,7 +1,7 @@ ``` name: vizzini packages: - - golang-1.21-linux + - golang-1.22-linux - vizzini templates: ```  ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.97.0...v2.98.0">https://github.com/cloudfoundry/diego-release/compare/v2.97.0...v2.98.0</a> ## Resources - [Download release 2.98.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.98.0). </pre>
garden-runc	1.52.0	<p>▼ v1.52.0</p> <pre> ## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.51.0...v1.52.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.51.0...v1.52.0</a> ## Resources - [Download release 1.52.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.52.0). </pre>

Component	Version	Release Notes
loggregator-agent	8.1.0	<p>▼ v8.1.0</p> <pre>## What's Changed * Replace usages of `grpc.Dial` with `grpc.NewClient` which does not open connections until necessary * Bump dependencies ### Experimental OTel Collector changes * Added `temporary_emit_otel_traces` property to the loggr-forwarder-agent and loggr-forwarder-agent-windows jobs. Setting this property to `true` activates conversion of appropriately tagged http timers to OpenTelemetry traces (it defaults to `false`). See cloudfoundry/gorouter#407. **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.3...v8.1.0">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.3...v8.1.0</a></pre> <p>▼ v8.0.4</p> <pre>Don't use. It contains the code changes from v8.1.0 but without a semver minor bump to indicate new functionality.</pre>
mapfs	1.2.68	<p>▼ v1.2.68</p> <pre>## Dependencies * **gomega:** Updated to v1.33.0. For more information, see [gomega] (<a href="https://github.com/onsi/gomega">https://github.com/onsi/gomega</a>). * **mapfs:** Updated to v`3fb73af`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> <p>▼ v1.2.67</p> <pre>## Dependencies * **mapfs:** Updated to v`b5baec0`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre>

Component	Version	Release Notes
nfs-volume	7.1.63	<p>▼ v7.1.63</p> <pre> ## Changes * Add final release 7.1.62 [ci skip] ## Dependencies * **gomega:** Updated to v1.33.0. For more information, see [gomega] (https://github.com/onsi/gomega). * **nfsbroker:** Updated to v`5d71277`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`31062e6`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre> <p>▼ v7.1.62</p> <pre> ## Changes * Bump sqlite from 3.45.2 to 3.45.3 (#881) ## Dependencies * **nfsbroker:** Updated to v`680bc33`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`279655c`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre>
otel-collector	0.4.1	

Component	Version	Release Notes
routing	0.296.0	<p>▼ v0.296.0</p> <pre> ## Changes - Pass availability zone in route-registrar for AZ-aware routing of system components - Bump Golang to 1.22 ## Bosh Job Spec changes: ```diff diff --git a/jobs/acceptance_tests/spec b/jobs/acceptance_tests/spec index e1a6a9ae..8122ddaf 100644 --- a/jobs/acceptance_tests/spec +++ b/jobs/acceptance_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.21-linux + - golang-1.22-linux - acceptance_tests - rtr - cf-cli-8-linux diff --git a/jobs/smoke_tests/spec b/jobs/smoke_tests/spec index b230192b..02edfd9d 100644 --- a/jobs/smoke_tests/spec +++ b/jobs/smoke_tests/spec @@ -7,7 +7,7 @@ templates: bpm.yml.erb: config/bpm.yml packages: - - golang-1.21-linux + - golang-1.22-linux - acceptance_tests - cf-cli-8-linux ``` ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.295.0...v0.296.0">https://github.com/cloudfoundry/routing-release/compare/v0.295.0...v0.296.0</a> ## Resources - [Download release 0.296.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.296.0). </pre>

Component	Version	Release Notes
silk	3.46.0	<p>▼ v3.46.0</p> <pre> ## Changes - Bump Golang to 1.22 ## Built with go 1.22.2 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.45.0...v3.46.0">https://github.com/cloudfoundry/silk-release/compare/v3.45.0...v3.46.0</a> ## Resources - [Download release 3.46.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/silk-release?version=3.46.0). </pre>
smb-volume	3.1.66	<p>▼ v3.1.66</p> <pre> ## Changes * Add final release 3.1.65 [ci skip] ## Dependencies * **smbbroker:** Updated to v`b2fb57d`. For more information, see [smbbroker](http://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`2335f8e`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver). </pre>
smoke-tests	4.10.0	
syslog	12.2.5	<p>▼ v12.2.5</p> <pre> ## What's Changed * Bump dependencies **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.2.4...v12.2.5">https://github.com/cloudfoundry/syslog-release/compare/v12.2.4...v12.2.5</a> </pre>
tanzu-jammy-stack	1.0.1	

## 6.0.1

**Release Date:** 04/17/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue](#).

- **[Feature]** Add option to enable concurrent read/writes for HTTP/1

- Bump bpm to version 1.2.18
- Bump diego to version 2.97.0
- Bump loggregator-agent to version 8.0.3
- Bump mapfs to version 1.2.66
- Bump nfs-volume to version 7.1.61
- Bump otel-collector to version 0.4.1
- Bump smb-volume to version 3.1.64
- Bump smoke-tests to version 4.10.0
- Bump syslog to version 12.2.4

Component	Version	Release Notes
ubuntu-jammy stemcell	1.423	
bpm	1.2.18	
cf-networking	3.45.0	
cflinuxfs3	0.387.0	
cflinuxfs4	1.82.0	
cf-cli	1.60.0	
count-cores-indicator	2.0.0	
diego	2.97.0	<p>▼ v2.97.0</p> <pre> ## Changes - Adds support for comma-delimited destinations in ASGs - See: <a href="https://github.com/cloudfoundry/executor/pull/96">https://github.com/cloudfoundry/executor/pull/96</a> and <a href="https://github.com/cloudfoundry/bbs/pull/94">https://github.com/cloudfoundry/bbs/pull/94</a> - Bump bosh package blobs - Bumps `jq` to `1.7.1` - Bumps `tar` - Bump go.mod dependencies ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.96.0...v2.97.0">https://github.com/cloudfoundry/diego-release/compare/v2.96.0...v2.97.0</a> ## Resources - [Download release 2.97.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.97.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.97.0</a>). </pre>
garden-runc	1.51.0	

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
loggregator-agent	8.0.3	<p>▼ v8.0.3</p> <pre>## What's Changed * Bump dependencies * Bump to [go1.21.9] (<a href="https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ">https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ</a>) **Full Changelog**: <a href="https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.2...v8.0.3">https://github.com/cloudfoundry/loggregator-agent-release/compare/v8.0.2...v8.0.3</a></pre>
mapfs	1.2.66	<p>▼ v1.2.66</p> <pre>## Dependencies * **mapfs:** Updated to v`b0b6bfa`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> <p>▼ v1.2.65</p> <pre>## Changes * Golang: Updated to v1.22.2. (#241) ## Dependencies * **mapfs:** Updated to v`a80b833`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre> <p>▼ v1.2.64</p> <pre>## Dependencies * **v2:** Updated to v2.17.1. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **mapfs:** Updated to v`cd8e7e6`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>).</pre>

Component	Version	Release Notes
nfs-volume	7.1.61	<p>▼ v7.1.61</p> <pre> ## Changes * Golang: Updated to v1.22.2 (#860) * Bump openssl- from 3.2.1 to 3.3.0 (#871) ## Dependencies * **nfsbroker:** Updated to v`1a70719`. For more information, see [nfsbroker](https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`35b8c6f`. For more information, see [nfsv3driver](https://github.com/cloudfoundry/nfsv3driver). </pre> <p>▼ v7.1.60</p> <pre> ## Dependencies * **nfsbroker:** Updated to v`8aec99d`. For more information, see [nfsbroker](https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`fb67285`. For more information, see [nfsv3driver](https://github.com/cloudfoundry/nfsv3driver). </pre>
otel-collector	0.4.1	<p>▼ v0.4.1</p> <pre> ## What's Changed * Bump dependencies * Bump to [gol.21.9] (https://groups.google.com/g/golang-announce/c/YgW0sx8mN3M/m/khALNYGdAAAJ) **Full Changelog**: https://github.com/cloudfoundry/otel-collector-release/compare/v0.4.0...v0.4.1 </pre>
routing	0.295.0	
silk	3.45.0	

Component	Version	Release Notes
smb-volume	3.1.64	<p>▼ v3.1.64</p> <pre>## Dependencies * **smbbroker:** Updated to v`02f340b`. For more information, see [smbbroker](http://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`fb88dd0`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.63</p> <pre>## Changes * Golang: Updated to v1.22.2 (#381) ## Dependencies * **smbbroker:** Updated to v`b380e77`. For more information, see [smbbroker](http://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`0c36c10`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver).</pre> <p>▼ v3.1.62</p> <pre>## Dependencies * **v2:** Updated to v2.17.1. For more information, see [v2](https://github.com/onsi/ginkgo). * **smbbroker:** Updated to v`f176916`. For more information, see [smbbroker](http://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`5ee16dc`. For more information, see [smbdriver](http://github.com/cloudfoundry/smbdriver).</pre>
smoke-tests	4.10.0	<p>▼ 4.10.0</p> <pre>Create bosh final release 4.10.0</pre> <p>▼ 4.9.5</p> <pre>Create bosh final release 4.9.5 ## What's Changed * Upgrade Golang to 1.22 by @tas-operability-bot in https://github.com/pivotal/smoke-tests/pull/138 **Full Changelog**: https://github.com/pivotal/smoke-tests/compare/4.9.5...4.9.5</pre>

Component	Version	Release Notes
syslog	12.2.4	<p>▼ v12.2.4</p> <pre>## What's Changed * Bump dependencies * Bump packaged Golang to go1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/syslog-release/compare/v12.2.3...v12.2.4">https://github.com/cloudfoundry/syslog-release/compare/v12.2.3...v12.2.4</a></pre>
tanzu-jammy-stack	1.0.1	

## 6.0.0

Release Date: 04/09/2024



This release is susceptible to a [known issue](#) where Gorouter returns an incorrect HTTP status code in response to requests with an "HTTP 100 Continue" interim status header. To resolve this issue, see the Broadcom Knowledge Base article [Gorouter Returns wrong HTTP response code to client when the request flow uses HTTP 100-continue](#).

- **[Breaking Change]** Change default internal route service port to 7070
- **[Breaking Change]** Replace cpu entitlement counters with cpu\_entitlement percentage gauge
- **[Breaking Change]** Remove (deprecated) Metrics Agent and Metrics Discovery Release
- **[Breaking Change]** Gorouter's deprecated /varz and /healthz endpoints on port 8080 have been removed
- **[Feature]** Add support for NTLM authentication in Gorouter
- **[Feature]** Adds Diego support for Docker workloads using OCI images
- **[Feature]:** Gorouters can be configured to prefer routing to app instances in the same AZ as the router
- **[Feature]** Operators can now turn off non-TLS load balancer health check endpoints for Gorouter and TCP Router via the “Enable HTTP load balancer health checks” properties in the “Networking” tab
- **[Feature]** Gorouter now supports LB Health Checks over TLS on port 8443
- **[Feature]** Expose a custom environment identifier on component logs forwarded via syslog
- **[Feature Improvement]** Make database “encrypt key” setting more intentional, to avoid password-manager autofilling of the field
- **[Feature Improvement]** Reintroduce global log rate limit
- **[Feature Improvement]** Apps using readiness health checks will now see audit.app.process.notready and audit.app.process.ready events reported to `cf events`

- **[Feature Improvement]** Garden now emits an `UnkillableContainers` metric to help identify cells that will be unable to redeploy successfully without operator intervention
- **[Feature Improvement]** Adds opt-in support for NTLM + other challenge-response based authentication using `Authorization: Negotiate` flows by automatically enabling sticky sessions for those requests.
- **[Feature Improvement]** Adds support for `Partitioned` cookies to allow for sticky sessions in embedded contexts.
- **[Feature Improvement]** OTel Collector marks OTLP Sums as monotonic if they originate from a Loggregator counter
- **[Feature Improvement]** Allow to configure w3c tracing headers in router

Component	Version	Release Notes
ubuntu-jammy stemcell	1.406	
bpm	1.2.17	

Component	Version	Release Notes
cf-networking	3.45.0	<p>▼ v3.45.0</p> <pre> ## Changes - Go dependency bumps - Added config for staticcheck - Removed references to consul from documentation ## Bosh Job Spec changes: ```diff diff --git a/jobs/policy-server-asg-syncer/spec b/jobs/policy-server-asg-syncer/spec index 748c39a7..4c6c9a4e 100644 --- a/jobs/policy-server-asg-syncer/spec +++ b/jobs/policy-server-asg-syncer/spec @@ -109,7 +109,7 @@ properties: description: "Trusted CA for UAA server." uaa_hostname: -   description: "Host name for the UAA server. E.g. the service advertised via Consul DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." +   description: "Host name for the UAA server. E.g. the service advertised via Bosh DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." default: uaa.service.cf.internal uaa_port: diff --git a/jobs/policy-server-internal/spec b/jobs/policy-server-internal/spec index 7095775d..029e723f 100644 --- a/jobs/policy-server-internal/spec +++ b/jobs/policy-server-internal/spec @@ -41,7 +41,7 @@ properties: default: 31946 health_check_timeout_seconds: -   description: "Health check timeout for Consul DNS." +   description: "Health check timeout" default: 5 internal_listen_port: @@ -52,7 +52,7 @@ properties: description: "Trusted CA certificate that was used to sign the vxlan policy agent's client cert and key." server_cert: -   description: "Server certificate for TLS. Must have common name that matches the Consul DNS name of the policy server, eg `policy-server.service.cf.internal`." +   description: "Server certificate for TLS. Must have common name that matches the Bosh DNS name of the policy server, eg `policy-server.service.cf.internal`." server_key: description: "Server key for TLS." </pre>

Component	Version	Release Notes	
		<pre> diff --git a/jobs/policy-server/spec b/jobs/policy-server/spec index 0d9f5157..8e2ccfa8 100644 --- a/jobs/policy-server/spec +++ b/jobs/policy-server/spec @@ -101,7 +101,7 @@ properties: description: "Trusted CA for UAA server." uaa_hostname: -   description: "Host name for the UAA server. E.g. the service advertised via Consul DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." +   description: "Host name for the UAA server. E.g. the service advertised via Bosh DNS. Must match common name in the UAA server cert. Must be listed in `uaa.zones.internal.hostnames`." default: uaa.service.cf.internal uaa_port: ``` ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/cf-networking-release/compare/v3.44.0...v3.45.0">https://github.com/cloudfoundry/cf-networking-release/compare/v3.44.0...v3.45.0</a> ## Resources - [Download release 3.45.0 from bosh.io](https://bosh.io/releases/github.com/cloudfoundry/cf-networking-release?version=3.45.0). </pre>	
cflinuxfs3	0.387.0		
cflinuxfs4	1.82.0		
cf-cli	1.60.0		
count-cores-indicator	2.0.0		

Component	Version	Release Notes
diego	2.96.0	<p>▼ v2.96.0</p> <pre> ## Changes - Bump to golang 1.21.8 - Golang package dependency bumps - Includes moving from docker v20 to docker v26 - Includes moving from pgx v3 to pgx v5 - Remove references to Consul from boshrelease + documentation - Many fixes to remove deprecated code and otherwise fix linter violations.  ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/diego-release/compare/v2.95.0...v2.96.0">https://github.com/cloudfoundry/diego-release/compare/v2.95.0...v2.96.0</a>  ## Resources - [Download release 2.96.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.96.0">https://bosh.io/releases/github.com/cloudfoundry/diego-release?version=2.96.0</a>). </pre>
garden-runc	1.51.0	<p>▼ v1.51.0</p> <pre> ## Changes - Bumped Golang to 1.21.8 - Golang package dependency bumps - Many updates to get codebase passing the staticcheck linker - Updated garden-integration-tests to be a little less flakey  ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/garden-runc-release/compare/v1.50.0...v1.51.0">https://github.com/cloudfoundry/garden-runc-release/compare/v1.50.0...v1.51.0</a>  ## Resources - [Download release 1.51.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.51.0">https://bosh.io/releases/github.com/cloudfoundry/garden-runc-release?version=1.51.0</a>). </pre>
loggregator-agent	8.0.2	
mapfs	1.2.63	<p>▼ v1.2.63</p> <pre> ## Dependencies * **v2:** Updated to v2.17.0. For more information, see [v2] (<a href="https://github.com/onsi/ginkgo">https://github.com/onsi/ginkgo</a>). * **mapfs:** Updated to v`5381efc`. For more information, see [mapfs] (<a href="https://github.com/cloudfoundry/mapfs">https://github.com/cloudfoundry/mapfs</a>). </pre>

<b>Component</b>	<b>Version</b>	<b>Release Notes</b>
nfs-volume	7.1.59	<p>▼ v7.1.59</p> <pre> ## Changes * Bump util-linux from 2.39.3 to 2.40 (#853) ## Dependencies * **nfsbroker:** Updated to v`7bc7bb0`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`15c152b`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre> <p>▼ v7.1.58</p> <pre> ## Dependencies * **nfsbroker:** Updated to v`e850d95`. For more information, see [nfsbroker] (https://github.com/cloudfoundry/nfsbroker). * **nfsv3driver:** Updated to v`8af81b5`. For more information, see [nfsv3driver] (https://github.com/cloudfoundry/nfsv3driver). </pre>
otel-collector	0.4.0	

Component	Version	Release Notes
routing	0.295.0	<p>▼ v0.295.0</p> <pre> ## Changes - Resolves #401 by reverting the removal of the deprecated BuildNameToCertificate() call - Bumps to golang 1.21.9 + golang.org/x/net 0.23.0 to patch CVE-2023-45288 ## Built with go 1.21.9 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.294.0...v0.295.0">https://github.com/cloudfoundry/routing-release/compare/v0.294.0...v0.295.0</a> ## Resources - [Download release 0.295.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.295.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.295.0</a>). </pre> <p>▼ v0.294.0</p> <pre> ⚠ This release contains a known issue: gorouter will no longer present the most specific certificate match but rather the first certificate that matches. See <a href="https://github.com/cloudfoundry/routing-release/issues/401">https://github.com/cloudfoundry/routing-release/issues/401</a> for details. Upgrading to routing-release 0.295.0 is advised. ⚠ ## Changes - [Bump haproxy to 2.8.7] (<a href="https://github.com/cloudfoundry/routing-release/commit/13b39eb5185656c3557c1ab15b5b13752b2ff6d8">https://github.com/cloudfoundry/routing-release/commit/13b39eb5185656c3557c1ab15b5b13752b2ff6d8</a>) - [update templates to not refer to consul] (<a href="https://github.com/cloudfoundry/routing-release/commit/8216c056b1463bd1d7bf636a749568f70cb924d2">https://github.com/cloudfoundry/routing-release/commit/8216c056b1463bd1d7bf636a749568f70cb924d2</a>) - [Default the routing_api.enabled_api_endpoints to mtls] (<a href="https://github.com/cloudfoundry/routing-release/commit/2e96c2c932f7f945c3c7c15a768d0afffc80de446">https://github.com/cloudfoundry/routing-release/commit/2e96c2c932f7f945c3c7c15a768d0afffc80de446</a>) - [Update template test for mTLS routing api default] (<a href="https://github.com/cloudfoundry/routing-release/commit/469d9e0a4eb0ac6015695ba27c6da80576b29801">https://github.com/cloudfoundry/routing-release/commit/469d9e0a4eb0ac6015695ba27c6da80576b29801</a>) - [Upgrade cf-cli-8-linux] (<a href="https://github.com/cloudfoundry/routing-release/commit/b19a25052ed7982c83524ac87d22ed2f316201a2">https://github.com/cloudfoundry/routing-release/commit/b19a25052ed7982c83524ac87d22ed2f316201a2</a>) ## Bosh Job Spec changes: ``` diff diff --git a/jobs/routing-api/spec b/jobs/routing-api/spec index 1d7efe3c..2e5cd361 100644 --- a/jobs/routing-api/spec +++ b/jobs/routing-api/spec @@ -95,7 +95,7 @@ properties: routing_api.enabled_api_endpoints: description: "Protocols that the routing api will listen on. Possible values: 'mtls', or 'both' (mTLS + HTTP)" </pre>

Component	Version	Release Notes
		<pre>-     default: "both" +     default: "mtls" routing_api.mtls_port: description: "Port on which Routing API is running, listening with mTLS." default: 3001 ``` ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/routing-release/compare/v0.293.0...v0.294.0">https://github.com/cloudfoundry/routing-release/compare/v0.293.0...v0.294.0</a> ## Resources - [Download release 0.294.0 from bosh.io](<a href="https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.294.0">https://bosh.io/releases/github.com/cloudfoundry/routing-release?version=0.294.0</a>).</pre>

Component	Version	Release Notes
silk	3.45.0	<p>▼ v3.45.0</p> <pre> ## Changes - Fixes to stop using deprecated code in tests (`net.Error.Temporary()`) - Remove consul references from documentation - Fix issues bumping the code.cloudfoundry.org/executor package - Go package bumps ## Bosh Job Spec changes: ``diff diff --git a/jobs/silk-controller/spec b/jobs/silk-controller/spec index a0966a01..cc7529a8 100644 --- a/jobs/silk-controller/spec +++ b/jobs/silk-controller/spec @@ -45,11 +45,11 @@ properties: default: 46455 health_check_port: -   description: "Health check port for silk controller. Used by the Consul DNS health check." +   description: "Health check port for silk controller. Used by the Bosh DNS health check." default: 19683 health_check_timeout_seconds: -   description: "Health check timeout for Consul DNS." +   description: "Health check timeout" default: 5 listen_ip: @@ -64,7 +64,7 @@ properties: description: "Trusted CA certificate that was used to sign the silk daemon client cert and key." server_cert: -   description: "Server certificate for TLS. Must have common name that matches the Consul DNS name of the silk controller, eg silk-controller.service.cf.internal" +   description: "Server certificate for TLS. Must have common name that matches the Bosh DNS name of the silk controller, eg silk-controller.service.cf.internal" server_key: description: "Server key for TLS." diff --git a/jobs/silk-daemon/spec b/jobs/silk-daemon/spec index 7a1525b3..e3786357 100644 --- a/jobs/silk-daemon/spec +++ b/jobs/silk-daemon/spec @@ -70,7 +70,7 @@ properties: default: 3457 silk_controller.hostname: -   description: "Host name for the silk c </pre>

Component	Version	Release Notes
		<pre> ontroller. E.g. the service advertised via C onsul DNS. Must match common name in the silk_ controller.server_cert" +   description: "Host name for the silk c ontroller. E.g. the service advertised via B osh DNS. Must match common name in the silk_ controller.server_cert" default: "silk-controller.service.cf.intern al" silk_controller.listen_port: diff --git a/jobs/vxlan-policy-agent/spec b/jobs/vxlan-policy-agent/spec index 3118022b..802f04bb 100644 --- a/jobs/vxlan-policy-agent/spec +++ b/jobs/vxlan-policy-agent/spec @@ -41,7 +41,7 @@ properties: default: false policy_server.hostname: -   description: "Host name for the policy server. E.g. the service advertised via Cons ul DNS. Must match common name in the policy_ server.server_cert" +   description: "Host name for the policy server. E.g. the service advertised via Bosh DNS. Must match common name in the policy_se rver.server_cert" default: "policy-server.service.cf.interna l" policy_server.internal_listen_port: ``` ## Built with go 1.21.8 **Full Changelog**: <a href="https://github.com/cloudfoundry/silk-release/compare/v3.44.0...v3.45.0">https://github.com/cloudfoundry/silk-release/compare/v3.44.0...v3.45.0</a> ## Resources - [Download release 3.45.0 from bosh.io](ht tps://bosh.io/releases/github.com/cloudfoundr y/silk-release?version=3.45.0). </pre>

Component	Version	Release Notes
smb-volume	3.1.61	<p>▼ v3.1.61</p> <pre> ## Dependencies * **v2:** Updated to v2.17.0. For more information, see [v2] (https://github.com/onsi/ginkgo). * **gomega:** Updated to v1.32.0. For more information, see [gomega] (https://github.com/onsi/gomega). * **smbbroker:** Updated to v`bab4864`. For more information, see [smbbroker] (https://github.com/cloudfoundry/smbbroker). * **smbdriver:** Updated to v`7f3242d`. For more information, see [smbdriver] (https://github.com/cloudfoundry/smbdriver). </pre>
smoke-tests	4.8.5	
syslog	12.2.3	
tanzu-jammy-stack	1.0.1	

## How to install

To install Isolation Segment v6.0, see [Installing Isolation Segment](#).

To install Isolation Segment v6.0, you must first install Tanzu Operations Manager v6.0. For more information, see the [VMware Tanzu Operations Manager documentation](#).

## New features in Isolation Segment v6.0

These are the new features for Isolation Segment v6.0.

### Reintroduction of global log rate limit

TAS v3.0 introduced granular app log rate limits for fine-grained control over application log rates.

Isolation Segment v4.0 removed the older global log rate limit feature **App log rate limit (deprecated)** under **App Containers**. This was problematic for operators who were performing a jump upgrade to Isolation Segment v4.0 (skipping v3.0), as logs would not be rate limited until application-based log rate limits were applied.

Isolation Segment v6.0 restores the global log rate limit, so that operators can perform upgrades while retaining log rate limits. Operators must configure the same setting separately for both VMware Tanzu Application Service for VMs and TAS for VMs [Windows].

If you had previously set a global log rate limit, this limit is re-applied following the upgrade to Isolation Segment v6.0.

## Breaking changes

There are no breaking changes for Isolation Segment v6.0.

## Known issues

There are no known issues for Isolation Segment v6.0.

# Architecture

In this section:

- **Components**
  - TAS for VMs components
  - Diego components and architecture
  - TAS for VMs routing architecture
  - Cloud Controller
  - Cloud Controller blobstore
  - Garden component
  - GrootFS disk usage
  - HTTP routing
  - User Accounts and Authentication overview
  - Services
  - CredHub
- **App management**
  - How apps are staged
  - The app container lifecycle on Diego architecture
  - How Diego balances app processes
  - High availability in TAS for VMs
  - How TAS for VMs maintains high availability
  - TAS for VMs security
  - General Data Protection Regulation (GDPR) and TAS for VMs

## Components

In this section:

- TAS for VMs runtime components
- Diego components and architecture
- TAS for VMs routing architecture
- Cloud Controller

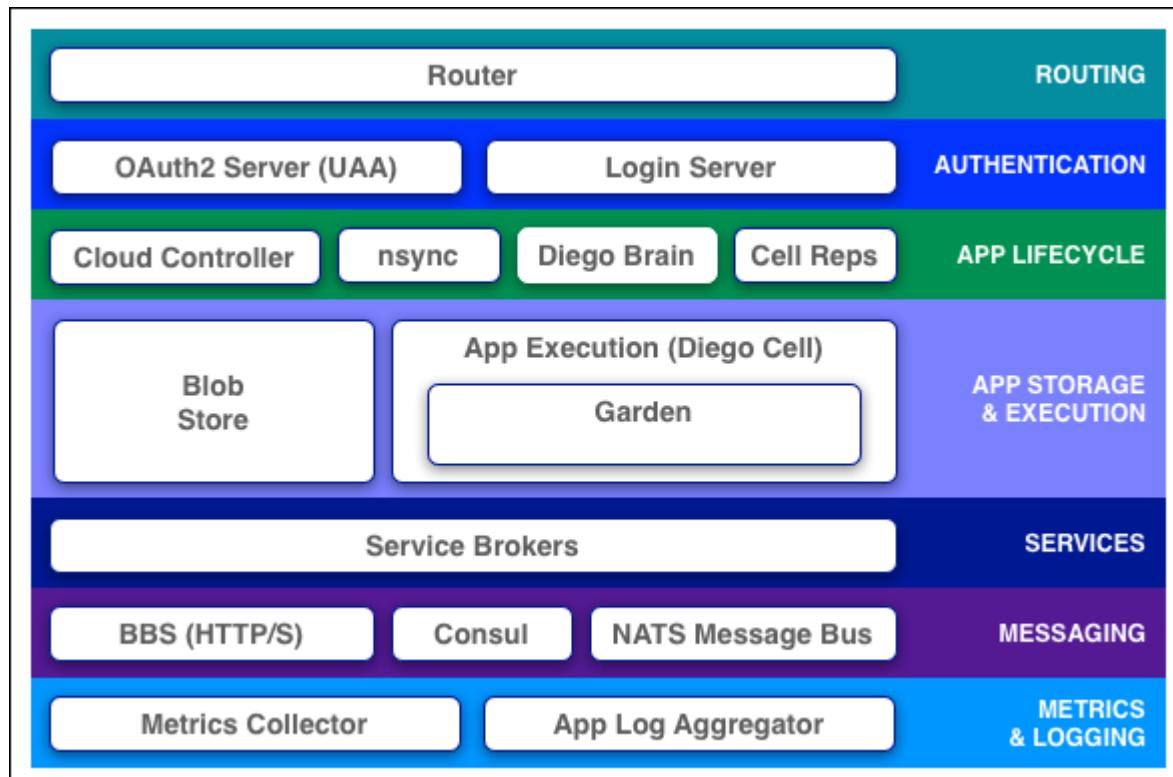
- Cloud Controller blobstore
- Garden components
- GrootFS disk usage
- HTTP routing
- User Accounts and Authentication overview
- Services
- CredHub

## TAS for VMs runtime components

This topic tells you about the VMware Tanzu Application Service for VMs (TAS for VMs) runtime components.

TAS for VMs components include a self-service application execution engine, an automation engine for application deployment, and lifecycle management, and a scriptable command line interface (CLI). Also, an integration with development tools to ease deployment processes. TAS for VMs has an open architecture that includes a buildpack mechanism for adding frameworks, an application services interface, and a cloud provider interface.

See the following descriptions for more information about TAS for VMs components. Some descriptions include links to more detailed documentation.



## Routing

### Router

The router routes incoming traffic to the appropriate component, either a Cloud Controller component or a hosted application running on a Diego Cell.

The router periodically queries the Diego Bulletin Board System (BBS) to determine which cells and containers each application currently runs on. Using this information, the router recomputes new routing tables based on the IP address of each cell virtual machine (VM) and the host-side port numbers for the cell's containers.

For more information about the routing tier, including the router, see [TAS for VMs Routing Architecture](#).

## Authentication

### OAuth2 Server (UAA) and Login Server

The OAuth2 server (the [UAA](#)) and Login Server work together to provide identity management.

## App Lifecycle

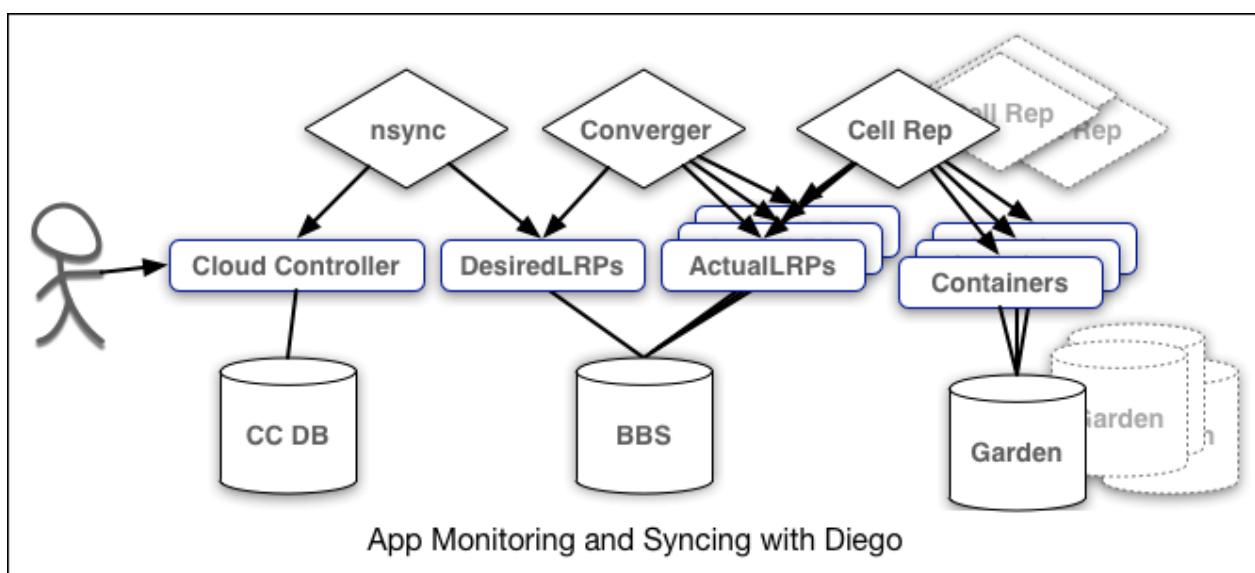
### Cloud Controller and Diego Brain

The [Cloud Controller](#) (CC) directs the deployment of applications. To push an app to TAS for VMs, you target the Cloud Controller. The Cloud Controller then directs the Diego Brain through the CC-Bridge components to coordinate individual [Diego cells](#) to stage and run applications.

The Cloud Controller also maintains records of [orgs](#), [spaces](#), [user roles](#), services, and more.

### nsync, BBS, and Cell Reps

To keep applications available, cloud deployments must constantly monitor their states and reconcile them with their expected states, starting and stopping processes as required.



The nsync, BBS, and Cell Rep components work together along a chain to keep apps running. At one end is the user. At the other end are the instances of applications running on widely-distributed VMs, which might crash or become unavailable.

Here is how the components work together:

- **nsync** receives a message from the Cloud Controller when the user scales an app. It writes the number of instances into a `DesiredLRP` structure in the Diego BBS database.
- **BBS** uses its convergence process to monitor the `DesiredLRP` and `ActualLRP` values. It runs or stops application instances as appropriate to ensure the `ActualLRP` count matches the `DesiredLRP` count.
- **Cell Rep** monitors the containers and provides the `ActualLRP` value.

## App Storage and Execution

### Blobstore

The blobstore is a repository for large binary files, which GitHub cannot easily manage because GitHub is designed for code. The blobstore contains the following:

- Application code packages
- Buildpacks
- Droplets

You can configure the blobstore as either an internal server or an external S3 or S3-compatible endpoint. For more information about the blobstore, see [How to use Elastic Runtime BLOB Storage Data] (<https://broadcomcms-software.wolkenservicedesk.com/external/article?articleNumber=297819>)

### Diego Cell

Application instances, application tasks, and staging tasks all run as `Garden` containers on the Diego Cell VMs. The Diego cell rep component manages the lifecycle of those containers and the processes running in them, reports their status to the Diego BBS, and emits their logs and metrics to `Loggregator`.

## Services

### Service Brokers

Applications typically depend on `services` such as databases or third-party SaaS providers. When a developer provisions and binds a service to an application, the service broker for that service is responsible for providing the service instance.

### Messaging

### Internal HTTPS and BBS

The component VMs of TAS for VMs communicate with each other internally through HTTP and HTTPS protocols, sharing temporary messages and data stored in Diego's `Bulletin Board System (BBS)`.

- BOSH Director collocates a `BOSH DNS` server on every deployed VM. All VMs keep up-to-date DNS records for all the other VMs in the same foundation, enabling service discovery between VMs. BOSH DNS also provides client-side load-balancing by randomly selecting a healthy VM when multiple VMs are available.

- Diego's [Bulletin Board System](#) (BBS) stores more frequently updated and disposable data such as cell and app status, unallocated work, and heartbeat messages, as well as longer-lived distributed locks. The BBS stores data in MySQL, using the [Go MySQL Driver](#).

The route emitter component uses the NATS protocol to broadcast the latest routing tables to the routers.

## Metrics and Logging

### Loggregator

The Loggregator (log aggregator) system streams application logs to developers.

For more information about the Loggregator architecture, see [Loggregator Architecture](#).

## Diego components and architecture

This topic tells you about the components that form and interact with the Diego system in VMware Tanzu Application Service for VMs (TAS for VMs).

TAS for VMs uses the Diego system to manage app containers. Diego components assume app scheduling and management responsibility from the Cloud Controller.

Diego is a self-healing container management system that attempts to keep the correct number of instances running in Diego cells to avoid network failures and crashes. Diego schedules and runs Tasks and Long-Running Processes (LRP). For more information about Tasks and LRPs, see [How the Diego Auction Allocates Jobs](#).

You can submit, update, and retrieve the desired number of Tasks and LRPs using the Bulletin Board System (BBS) API. For more information, see the [BBS Server](#) repository on GitHub.

## Learning how Diego runs an app

The following sections describe how Diego handles a request to run an app. This is only one of the processes that happen in Diego. For example, running an app assumes the app has already been staged.

For more information about the staging process, see [How Apps are Staged](#).

The following illustrations and descriptions do not include all of the components of Diego. For information about each Diego component, see [Diego Components](#).

The architecture discussed in the following steps includes the following high level blocks:

- api - cloud\_controller\_ng
- scheduler - auctioneer
- diego-api - bbs
- pxc-mysql - bbs db
- diego-cell - rep/executor, garden, loggregator-agent, route-emitter
- singleton-blobstore - droplets
- doppler - doppler
- log-api - traffic-controller

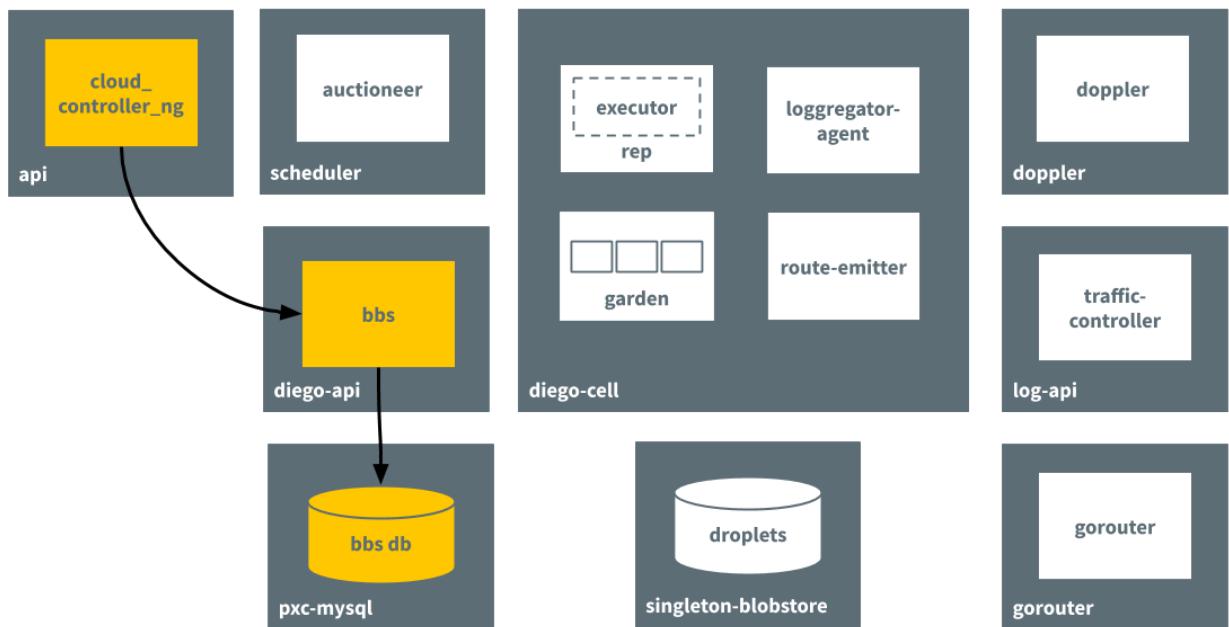
- gorouter - gorouter



The images below are based on the VM names in an open-source deployment of Cloud Foundry Application Runtime. In TAS for VMs, the processes interact in the same way, but are on different VMs. Correct VM names for each process are in the components sections of this topic.

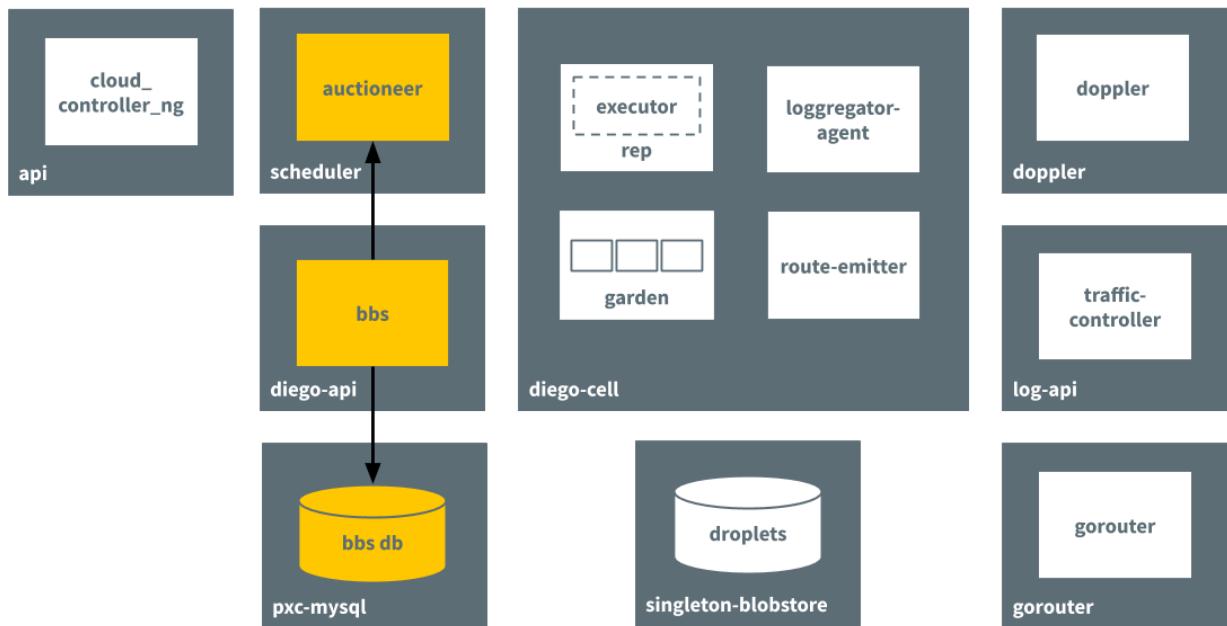
## Step 1: Receiving the request to run an app

Cloud Controller passes requests to run apps to the Diego BBS, which stores information about the request in its database.



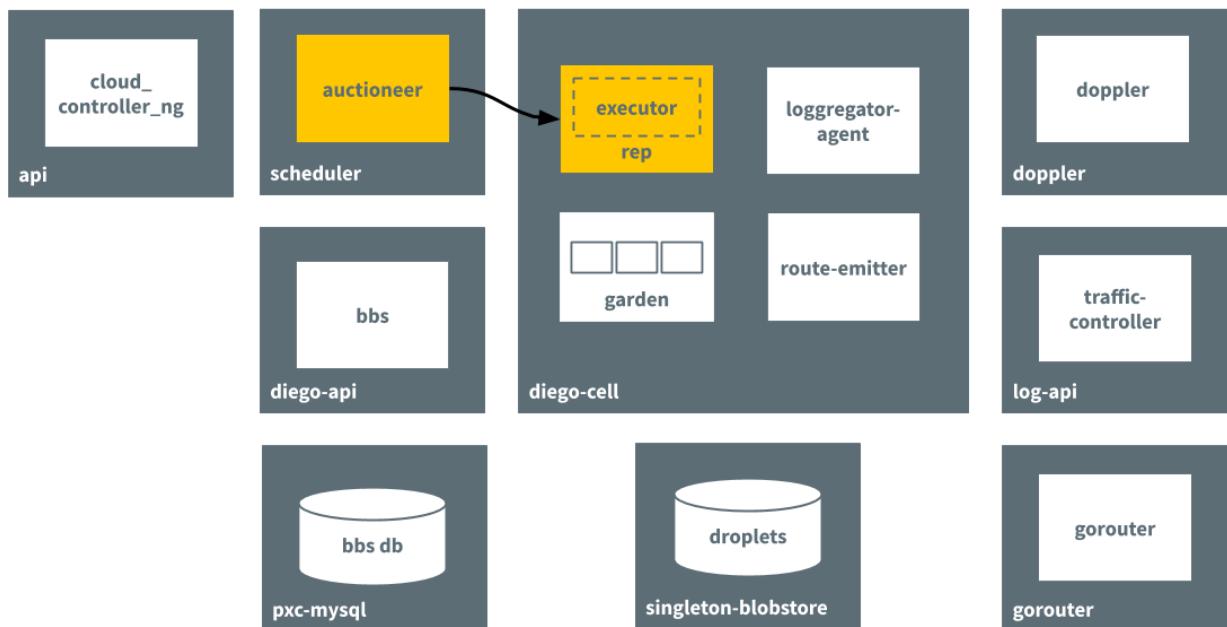
## Step 2: Passing the request to the auctioneer process

The BBS contacts the Auctioneer to create an auction based on the desired resources for the app. It references the information stored in its database.



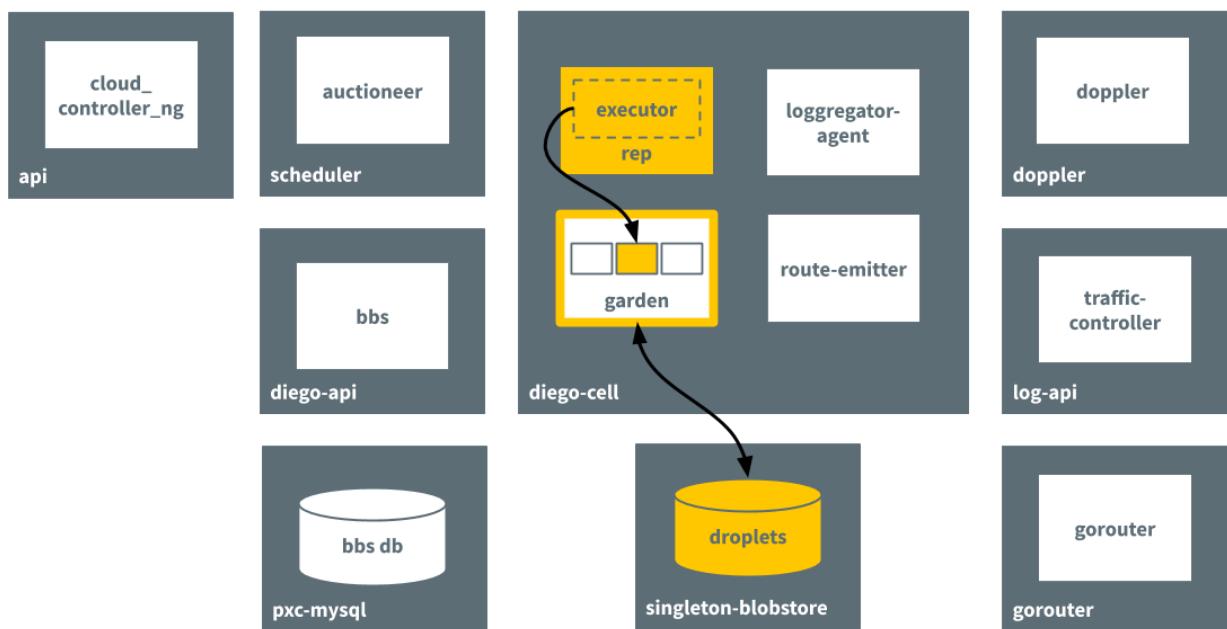
### Step 3: Performing the auction

Through an auction, the Auctioneer finds a Diego Cell to run the app on. The Rep job on the Diego Cell accepts the auction request.



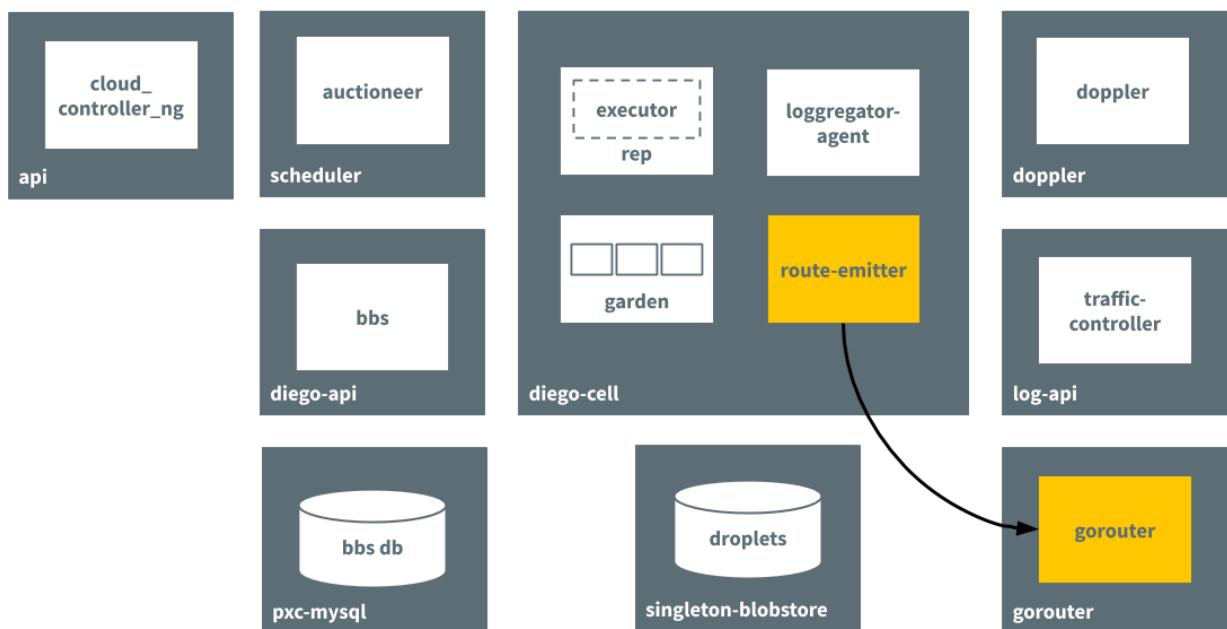
### Step 4: Creating the container and running the app

The in process Executor creates a Garden container in the Diego Cell. Garden downloads the droplet that resulted from the staging process and runs the app in the container.



## Step 5: Emitting a route for the app

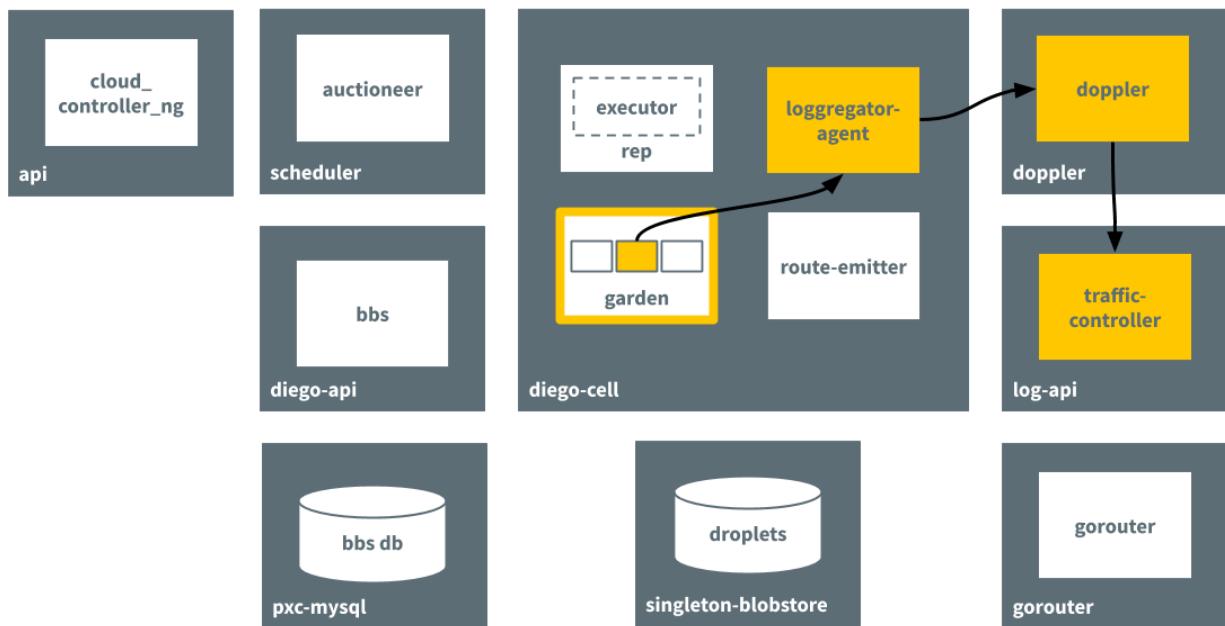
The `route-emitter` process emits a route registration message to Gorouter for the new app running on the Diego Cell.



## Step 6: Sending logs to the Loggregator

Loggregator agent forwards app logs, errors, and metrics to the TAS for VMs Loggregator.

For more information, see [App Logging in TAS for VMs](#).



## Diego components

The following table describes the jobs that are part of the TAS for VMs Diego BOSH release.

Component	Function
<b>Job:</b> auctioneer	<ul style="list-style-type: none"> <li>Distributes work through auction to Cell Reps over SSL/TLS. For more information, see <a href="#">How the Diego Auction Allocates Jobs</a>.</li> </ul>
<b>VM:</b> diego_brain	<ul style="list-style-type: none"> <li>Maintains a lock in Locket to ensure only one auctioneer handles auctions at a time.</li> </ul>
<b>Job:</b> bbs	<ul style="list-style-type: none"> <li>Maintains a real-time representation of the state of the Diego cluster, including desired LRPs, running LRPs, and in-flight Tasks.</li> </ul>
<b>VM:</b> diego_database	<ul style="list-style-type: none"> <li>Provides an RPC-style API over HTTP to Diego Core components for external clients as well as internal clients, including the SSH Proxy and Route Emitter.</li> <li>Ensures consistency and fault tolerance for Tasks and LRPs by comparing desired state with actual state.</li> <li>Keeps <code>DesiredLRP</code> and <code>ActualLRP</code> counts synchronized. If the <code>DesiredLRP</code> count exceeds the <code>ActualLRP</code> count, requests a start auction from the Auctioneer. If the <code>ActualLRP</code> count exceeds the <code>DesiredLRP</code> count, sends a stop message to the Rep on the Diego Cell hosting an instance.</li> </ul>
<b>Job:</b> file_server	<ul style="list-style-type: none"> <li>Serves static assets that can include general-purpose App Lifecycle binaries</li> </ul>
<b>VM:</b> diego_brain	
<b>Job:</b> locket	<ul style="list-style-type: none"> <li>Provides a consistent key-value store for maintenance of distributed locks and component presence</li> </ul>
<b>VM:</b> diego_database	

Component	Function
<b>Job:</b> rep	<ul style="list-style-type: none"> <li>Represents a Diego Cell in Diego Auctions for Tasks and LRPCs</li> </ul>
<b>VM:</b> diego_cell	<ul style="list-style-type: none"> <li>Runs Tasks and LRPCs by creating a container and then running actions in it</li> <li>Periodically ensures its set of Tasks and ActualLRPs in the BBS is in sync with the containers actually present on the Diego Cell</li> <li>Manages container allocations against resource constraints on the Diego Cell, such as memory and disk space</li> <li>Streams stdout and stderr from container processes to the metron-agent running on the Diego Cell, which in turn forwards to the Loggregator system</li> <li>Periodically collects container metrics and emits them to Loggregator</li> <li>Mediates all communication between the Diego Cell and the BBS</li> <li>Maintains a presence record for the Diego Cell in Locket</li> </ul>
<b>Job:</b> route_emitter	<ul style="list-style-type: none"> <li>Monitors <code>DesiredLRP</code> and <code>ActualLRP</code> states, emitting route registration and unregistration messages to Gorouter when it detects changes.</li> </ul>
<b>VM:</b> diego_cell	<ul style="list-style-type: none"> <li>Periodically emits the entire routing table to the TAS for VMs Gorouter.</li> </ul>
<b>Job:</b> diego-healthchecker	<ul style="list-style-type: none"> <li>An executable designed to perform TCP/HTTP based health checks of processes managed by monit in BOSH releases.</li> </ul>
<b>VM:</b> diego_cell	<ul style="list-style-type: none"> <li>Because the version of monit included in BOSH does not support specific tcp/http health checks, we designed this utility to perform health checking and restart processes if they become unreachable.</li> </ul>
<b>Job:</b> ssh_proxy	<ul style="list-style-type: none"> <li>Brokers connections between SSH clients and SSH servers</li> </ul>
<b>VM:</b> diego_brain	<ul style="list-style-type: none"> <li>Runs inside instance containers and authorizes access to app instances based on Cloud Controller roles</li> </ul>

## Additional information

The following resources provide more information about Diego components:

- The [Diego Release](#) repository on GitHub.
- The [Auctioneer](#) repository on GitHub.
- The [Bulletin Board System](#) repository on GitHub.
- The [File Server](#) repository on GitHub.
- The [Rep](#) repository on GitHub.
- The [Executor](#) repository on GitHub.
- The [Route-Emitter](#) repository on GitHub.
- [App SSH](#), [App SSH Overview](#), and the [Diego SSH](#) repository on GitHub.

## Maximum recommended Diego Cells

The maximum recommended Diego Cells is 250 Cells for each TAS for VMs deployment. By default, there is a hard limit of 256 addresses for vSphere deployments that use Silk for networking. This hard limit is

described in the [Silk Release documentation](#) on GitHub.

The default CIDR address block for the overlay network is 10.255.0.0/16. Each Diego Cell requires a subnet, and subnets (0-255) for each Diego Cell are allocated out of this network.

TAS for VMs deployments that do not use Silk for networking do not have a hard limit. However, operating a foundation with more than 250 Diego Cells is not recommended for the following reasons:

- Changes to the foundation can take a long time, potentially days or weeks depending on the `max-in-flight` value. For example, if there is a certificate expiring in a week, there might not be enough time to rotate the certificates before expiry. For more information, see [Basic Advice](#) in [Configuring TAS for VMs for Upgrades](#).
- A single foundation still has single points of failure, such as the certificates on the platform. The RAM that 250 Diego Cells provides is enough to host many business-critical apps.

## Components from other releases

The following table describes jobs that interact closely with Diego but are not part of the Diego TAS for VMs BOSH release.

Component	Function
<b>Job:</b> bosh-dns-aliases	<ul style="list-style-type: none"> <li>Provides service discovery through colocated DNS servers on all BOSH-deployed VMs</li> </ul>
<b>VM:</b> all	<ul style="list-style-type: none"> <li>Provides client-side load-balancing by randomly selecting a healthy VM when multiple VMs are available</li> </ul>
<b>Job:</b> cc_uploader	<ul style="list-style-type: none"> <li>Mediates uploads from the Executor to the Cloud Controller</li> </ul>
<b>VM:</b> diego_brain	<ul style="list-style-type: none"> <li>Translates simple HTTP POST requests from the Executor into complex multipart-form uploads for the Cloud Controller</li> </ul>
<b>Job:</b> database	<ul style="list-style-type: none"> <li>Provides a consistent key-value data store to Diego</li> </ul>
<b>VM:</b> mysql	
<b>Job:</b> loggregator-agent	<ul style="list-style-type: none"> <li>Forwards app logs, errors, and app and Diego metrics to the Loggregator Doppler component</li> </ul>
<b>VM:</b> all	
<b>Job:</b> cloud_controller_clo	<ul style="list-style-type: none"> <li>Runs a Diego sync process to ensure desired app data in Diego is in sync with the Cloud Controller.</li> </ul>
<b>VM:</b> clock_global	

## App lifecycle binaries

The following platform-specific binaries deploy apps and govern their lifecycle:

- The **Builder**, which stages a TAS for VMs app. The Builder runs as a Task on every staging request. It performs static analysis on the app code and does any necessary pre-processing before the app is first run.

- The **Launcher**, which runs a TAS for VMs app. The Launcher is set as the Action on the `DesiredLRP` for the app. It runs the start command with the correct system context, including working directory and environment variables.
- The **Healthcheck**, which performs a status check on running TAS for VMs app from inside the container. The Healthcheck is set as the CheckDefinition on the `DesiredLRP` for the app.

## Current implementations

- The buildpack app lifecycle implements the TAS for VMs buildpack-based deployment strategy. For more information, see the [buildpackapplifecycle](#) repository on GitHub.
- The Docker app lifecycle implements a Docker deployment strategy. For more information, see the [dockerapplifecycle](#) repository on GitHub.

## Additional information

The following resources provide more information about components from other releases that interact closely with Diego:

- The [CC-Uploader](#) repository on GitHub.
- [Garden](#) or the [Garden](#) repository on GitHub.
- The [Loggregator Release](#) repository on GitHub.
- The [BOSH DNS documentation](#).
- The [TPS](#) repository on GitHub.

## TAS for VMs Routing Architecture

This topic tells you about the routing architecture and flow in VMware Tanzu Application Service for VMs (TAS for VMs).

## Routing architecture components

The following summarizes the roles and responsibilities of various components depicted in the TAS for VMs routing architecture diagrams. These summaries are limited to the roles and responsibilities these components have pertaining to routing. For more complete descriptions of these components, see [TAS for VMs Concepts](#), [TAS for VMs Components](#), and [Diego Components and Architecture](#).

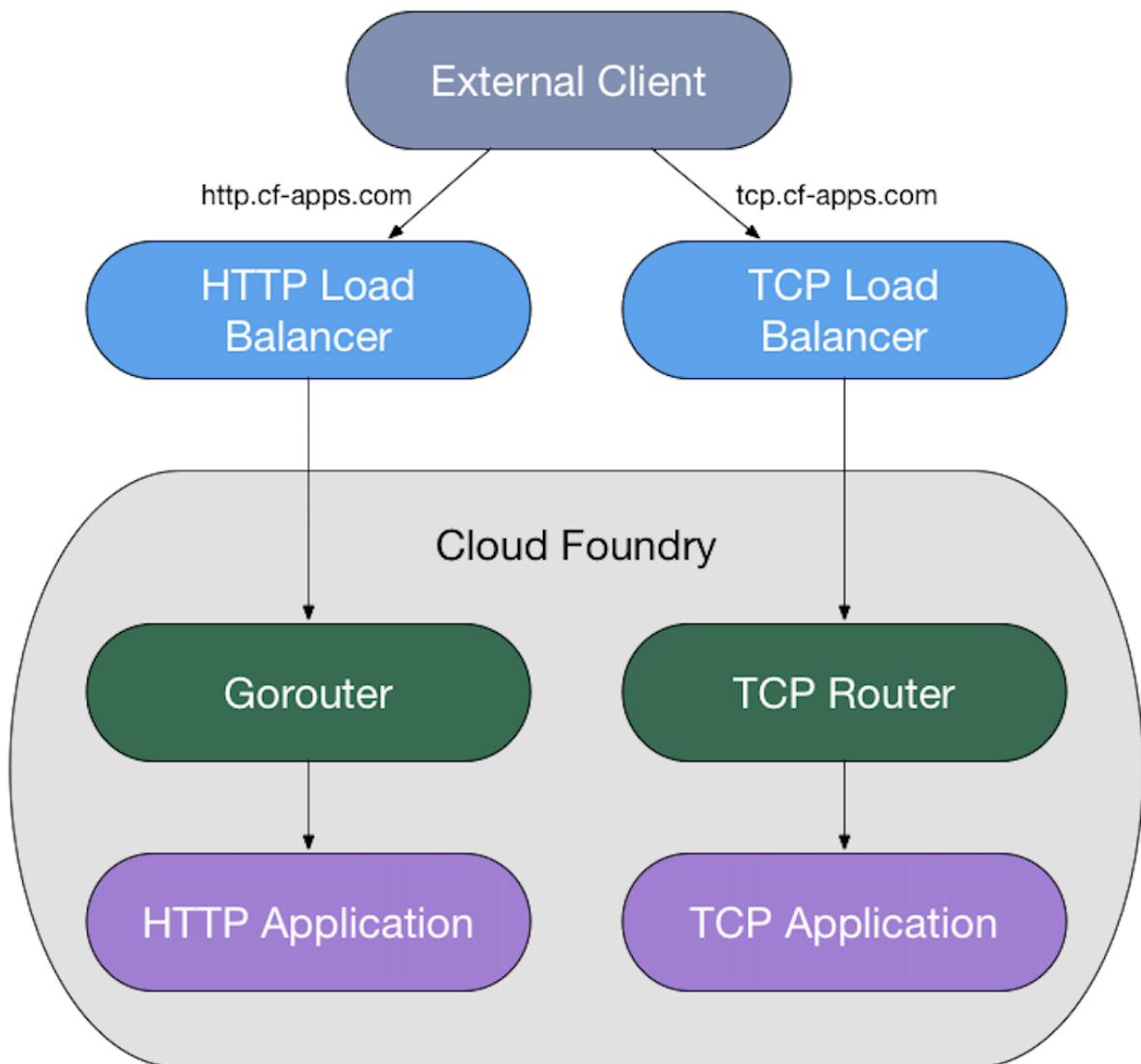
Component Name	Summary
BOSH manifest	Used to configure route registrar with route(s) for system components such as UAA and Loggregator.
Cloud Controller	Contains route metadata, including whether they are HTTP or TCP.
Diego BBS	Contains IP and port metadata as well as route metadata from Cloud Controller, which route emitter discovers.

<b>Component Name</b>	<b>Summary</b>
Diego cell	Manages app instances and tasks and long-running processes related to them. A route emitter runs on each cell.
Gorouter	Routes HTTP traffic coming into TAS for VMs to the appropriate component. Receives route updates through NATS. Routes that have not been updated in two minutes are pruned from the Gorouter's database.
NATS	Receives routing configuration from route emitter and provides same to Gorouter.
Route registrar	Sends routing metadata described in BOSH manifest for system components such as UAA and Loggregator to NATS. This is because the Diego cell does not have information about system components, only about user spaces.
Route emitter	Periodically emits route, IP, and port metadata to NATS or Routing API as registration and unregistration messages. Does not know about app instances on Diego cell, but knows what cell it belongs to and learns about what app instances are running on its cell by asking Diego BBS for information about app instances on the same cell.
Routing API	Receives routing configuration from route emitter and other internal clients, and provides routing configuration for TCP router.
Routing database	Saves some routing data from Routing API. If the Gorouter misses a message about an unmapped route from NATS, it does not get it again, so TCP router and Routing API can consult routing database for current state of routes.
TCP router	Routes TCP traffic coming into TAS for VMs to the appropriate component. Receives route updates through the routing API.
HealthChecker	An executable designed to perform TCP/HTTP-based health checks of processes managed by monit in BOSH releases. Because the version of monit included in BOSH does not support specific TCP/HTTP health checks, this utility is designed to perform health checking, and restart processes if they become unreachable.

## Making a request to external client

The following process tells you about how an external client makes a request to an app running on TAS for VMs:

1. The external client sends its request.
2. Your DNS service sends the request to the HTTP or TCP load balancer based on the prefix of the DNS name in the client request, such as `http` in `http.example.com`.
3. The load balancer sends the request to the load balancer's corresponding router.
4. The router sends the request to the app.



## Maintaining updated routing tables

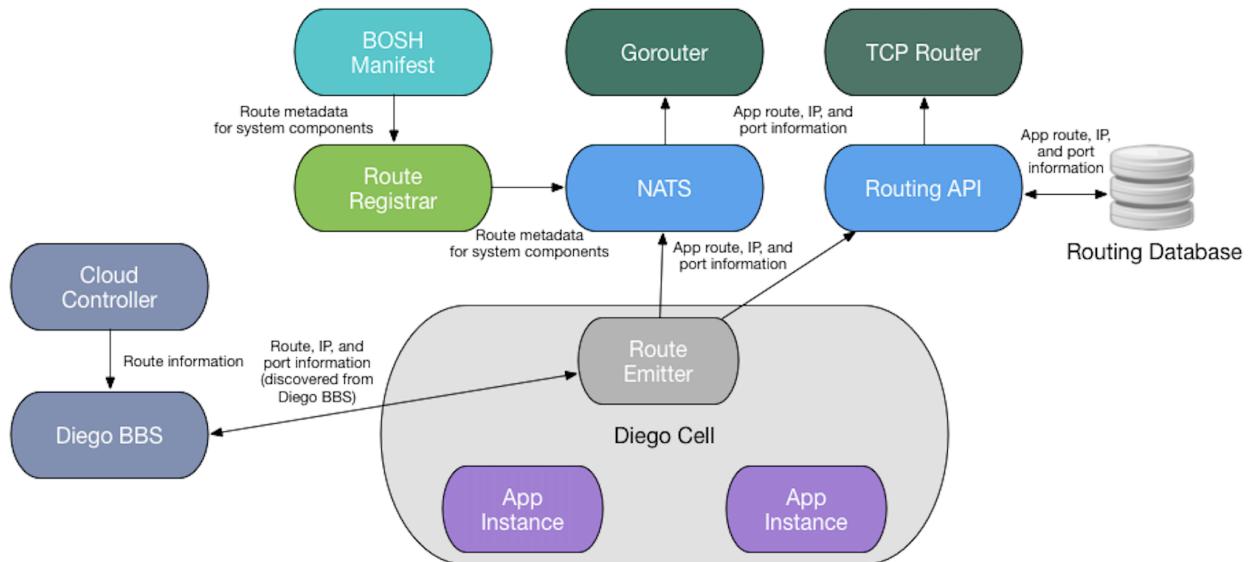
Because each app can have many instances, one app route can go to multiple containers. As Diego moves and scales app instances, the route emitter on each cell sends messages to NATS or the Routing API to register and deregister routes to the cell's app instances.

The route emitter periodically emits the routes it discovers from Diego BBS to NATS and the Routing API as registration and unregistration messages every twenty seconds. The Gorouter uses TLS to verify app identity and confirm that its routes are up-to-date. For more information about how TAS for VMs maintains route consistency, see [Preventing Misrouting in HTTP Routing](#).

The following process describes how a router obtains information about routes for an app running on TAS for VMs:

1. Cloud Controller component sends app route information to Diego BBS. For HTTP routing, route information includes the host and path of an external URL, as shown in the format of the `router.register` message in the Gorouter documentation on GitHub. For TCP routing, route information includes the route port on which the TCP connection was received; for more information, see the [Routing API documentation on GitHub](#).

2. Diego BBS coordinates the back end IP address and port where each instance of the app runs. When queried by the route emitter, the BBS sends this information along with the Cloud Controller app route information to the route emitter on the Diego cell where instances of the app are located.
3. If a route is HTTP, the route emitter on the Diego cells sends app route, IP, and port information to NATS, which then sends it to the Gorouter. If a route is TCP, the route emitter sends that information to the Routing API, which then sends it to the TCP router.
4. Gorouter and TCP router use the route, IP, and port information from the route emitter to map incoming app requests to back end app instance locations.



## Routing table recovery after component failure

Cloud Controller and Diego BBS have their own databases, while NATS and the Gorouter only store their data in memory. If NATS or the Gorouter are restarted, they lose all of their data and must wait for the route emitter to send data to them again. If Diego BBS is restarted, it can retrieve its data from Cloud Controller. If Cloud Controller is restarted, you must retrieve its data from a backup.

## Cloud Controller

Cloud Controller in VMware Tanzu Application Service for VMs (TAS for VMs) provides you with REST API endpoints to access the system. Cloud Controller maintains a database with tables for orgs, spaces, services, user roles, and more.

## Diego Auction

The Cloud Controller uses the [Diego Auction](#) to balance application processes over the [Diego Cells](#) in a TAS for VMs installation.

## Database (CC\_DB)

The Cloud Controller database has been tested with MySQL.

## Blobstore

To stage and run apps, TAS for VMs manages and stores app source code and other files in an S3-compatible blobstore.

Please see [Cloud Controller blobstore](#) for information.

## Testing

By default `rspec` runs a test suite with the SQLite in-memory database. Specify a connection string using the `DB_CONNECTION` environment variable to test against MySQL. For example:

```
DB_CONNECTION="mysql2://root:password@localhost:3306/ccng" rspec
```

## Cloud Controller blobstore

To stage and run apps, TAS for VMs manages and stores the following types of binary large object (blob) files:

Blob Type	Description	Location in Blobstore
App Package	Full contents of app directories, including source code and resource files, zipped into single blob files.	/cc-packages
Buildpacks	Buildpack directories, which Diego cells download to compile and stage apps with.	/cc-buildpacks
Resource Cache	Large files from app packages that the Cloud Controller stores with a SHA for later re-use. To save bandwidth, the TAS for VMs Command Line Interface (cf CLI) only uploads large application files that the Cloud Controller has not already stored in the resource cache.	/cc-resources
Buildpack Cache	Large files that buildpacks generate during staging, stored for later re-use. This cache lets buildpacks run more quickly when staging apps that have been staged previously.	cc-droplets/buildpack_cache
Droplets	Staged apps packaged with everything needed to run in a container.	/cc-droplets

TAS for VMs blobstores use the [Fog](#) Ruby gem to store blobs in services like Amazon S3, WebDAV, or the NFS filesystem. The file system location of an internal blobstore is `/var/vcap/store/shared`.

A single blobstore typically stores all five types of blobs, but you can configure the Cloud Controller to use separate blobstores for each type. This topic references staging and treats all blobstores as generic object stores.

For more information about staging, see [How Apps Are Staged](#).

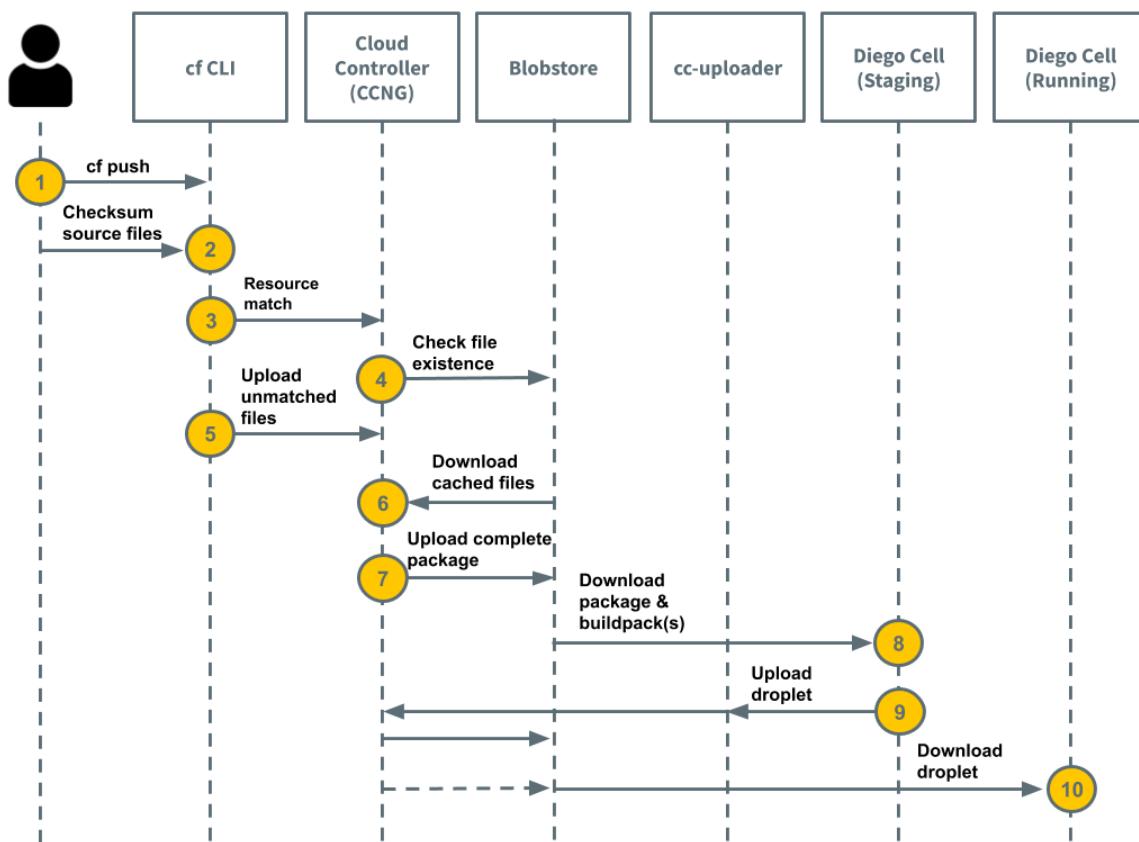
For more information about how specific third-party blobstores can be configured, see [Configuring File Storage for TAS for VMs](#).

## Staging using the blobstore

This section describes how staging buildpack apps uses the blobstore.

The following diagram illustrates how the staging process uses the blobstore. To walk through the same diagram in an app staging context, see [How Diego Stages Buildpack Apps](#). The staging process for buildpack apps includes a developer and the following components: CF Command Line, Cloud Controller (CCNG), Blobstore, cc-uploader, Diego Cell (Staging), and Diego Cell (Running).

- Step 1: cf push from Developer to CF CLI.
- Step 2: Checksum source files from Developer to CF CLI.
- Step 3: Resource Match from CF CLI to the CCNG.
- Step 4: Check file existence from the CCNG to Blobstore.
- Step 5: Upload unmatched files from CF CLI to CCNG.
- Step 6: Download cached files from Blobstore to CCNG.
- Step 7: Upload complete package from CCNG to Blobstore.
- Step 8: Download package and buildpack from Blobstore to Diego Cell (Staging).
- Step 9: Upload droplet from Diego Cell (Staging) through cc-uploader, then CCNG, to the Blobstore.
- Step 10: Download droplet from Blobstore to CCNG.



The process in which the staging process uses the blobstore is as follows:

1. **cf push:** A developer runs `cf push`.
2. **Create app:** The Cloud Foundry Command Line Interface (cf CLI) gathers local source code files and computes a checksum of each.

3. **Store app metadata:** The cf CLI makes a `resource_matches` request, which matches resources to Cloud Controller. The request lists file names and their checksums. For more information and an example API request, see [Resource Matches](#) in the TAS for VMs API documentation.
4. **Check file existence** includes the following:
  - a. The Cloud Controller makes a series of 'HEAD' requests to the blobstore to find out which files it has cached.
  - b. Cloud Controller content-addresses its cached files so that changes to a file result in it being stored as a different object.
  - c. Cloud Controller computes which files it has and which it needs the cf CLI to upload. This process can take a long time.
  - d. In response to the resource match request, Cloud Controller lists the files the cf CLI needs to upload.
5. **Upload unmatched files:** The cf CLI compresses and uploads the unmatched files to Cloud Controller.
6. **Download cached files:** Cloud Controller downloads, to its local disk, the matched files that are cached in the blobstore.
7. **Upload complete package** includes the following:
  - a. Cloud Controller compresses the newly uploaded files with the downloaded cached files in a ZIP file.
  - b. Cloud Controller uploads the complete package to the blobstore.
8. **Download package & buildpack(s):** A Diego Cell downloads the package and its buildpacks into a container and stages the app.
9. **Upload droplet** includes the following:
  - a. After the app has been staged, the Diego Cell uploads the complete droplet to 'cc-uploader'.
  - b. 'cc-uploader' makes a multi-part upload request to upload the droplet to Cloud Controller.
  - c. Cloud Controller enqueues an asynchronous job to upload to the blobstore.
10. **Download droplet** includes the following:
  - a. A Diego Cell attempts to download the droplet from Cloud Controller into the app container.
  - b. Cloud Controller asks the blobstore for a signed URL.
  - c. Cloud Controller redirects the Diego Cell droplet download request to the blobstore.
  - d. A Diego Cell downloads the app droplet from the blobstore and runs it.

## Blobstore Cleanup

**How Cloud Controller reaps expired packages, droplets, and buildpacks**

As new droplets and packages are created, the oldest ones associated with an app are marked as `EXPIRED` if they exceed the configured limits for packages and droplets stored per app.

Each night, starting at midnight, Cloud Controller runs a series of jobs to delete the data associated with expired packages, droplets, and buildpacks.

Enabling the native versioning feature on your blobstore increases the number of resources stored and costs. For more information, see [Using Versioning](#) in the AWS documentation.

## Automatic Orphaned Blob Cleanup

Orphaned Blobs are blobs that are stored in the blobstore, but which Cloud Controller does not list in its database. These are distinct from [Expired Blobs](#), which Cloud Controller can still link to a particular package, droplet, or buildpack.

Orphaned Blobs are typically created after a blob deletion fails silently or something else goes wrong.

Cloud Controller detects and removes Orphaned Blobs by scanning part of the blobstore daily and checking for any blobs that its database does not account for. The process scans through the entire blobstore every week, and only removes blobs that show as orphans for three consecutive days.

Cloud Controller performs this automatic cleanup when the `cloud_controller_worker` job property `cc.perform_blob_cleanup` is set to `true`.



Two instances of Cloud Foundry should **not** use the same blobstore buckets, as the uploaded blobs will be marked as 'orphaned' by the other Cloud Foundry instance and deleted.

## Manual blob cleanup

Cloud Controller does not track resource cache and buildpack cache blob-types in its database, so it does not [reap them automatically](#) as it does with app package, buildpack, and droplet type blobs.

To clean up the buildpack cache, admin users can run `cf curl -X DELETE /v2/blobstores/buildpack_cache`. This empties the buildpack cache completely, which is a safe operation.

To clean up the resource cache, delete it as follows:

- **Internal blobstore:** Run `bosh ssh` to connect to the blobstore VM (NFS or WebDav) and `rm *` the contents of the `/var/vcap/store/shared/cc-resources` directory.
- **External blobstore:** Use the file store's API to delete the contents of the `resources` bucket.

Do not manually delete app package, buildpack, or droplet blobs from the blobstore. To free up resources from those locations, run `cf delete-buildpack` for buildpacks or `cf delete` for app packages and droplets.

## Blobstore load

The load that Cloud Controller generates on its blobstore is unique due to resource matching. Many blobstores that perform well under normal read, write, and delete loads are overwhelmed by Cloud Controller's heavy use of HEAD requests during resource matching.

Pushing an app with large number of files causes Cloud Controller to check the blobstore for the existence of each file.

Parallel BOSH deployments of Diego Cells can also generate significant read load on the Cloud Controller blobstore as the cells perform evacuation. For more information, see the [Evacuation](#) section of the *App Container Lifecycle* topic.

## Blobstore interaction timeouts

Cloud Controller inherits default blobstore operation timeouts from Excon. Excon defaults to 60 second read, write, and connect timeouts.

For more information, see the [excon](#) repository on GitHub.

## Garden components

You can use Garden, the component that VMware Tanzu Application Service for VMs (TAS for VMs) uses to create and manage isolated environments called containers. Each instance of an app deployed to TAS for VMs runs within a container.

For more information about how containers work, see [Container Mechanics](#) in *Container Security*.

## Plug-in back ends

Garden has plug-in back ends for different platforms and runtimes. It specifies a set of interfaces that each platform specific back end must implement.

These interfaces contain methods to perform the following actions:

- Create and delete containers.
- Apply resource limits to containers.
- Open and attach network ports to containers.
- Copy files into and out of containers.
- Run processes within containers.
- Stream `STDOUT` and `STDERR` data out of containers.
- Annotate containers with arbitrary metadata.
- Snapshot containers for redeploys without downtime.

For more information, see the [Garden](#) repository on GitHub.

## Garden-runC back end

TAS for VMs currently uses the Garden-runC back end, a Linux-specific implementation of the Garden interface using the [Open Container Interface](#) (OCI) standard. Previous versions of TAS for VMs used the Garden-Linux back end. For more information, see the [Garden-Linux](#) repository on GitHub.

Garden-runC has the following features:

- Uses the same OCI low-level container execution code as Docker and Kubernetes, so container images run identically across all three platforms
- [AppArmor](#) is configured and enforced by default for all unprivileged containers
- Seccomp allowlisting restricts the set of system calls a container can access, reducing the risk of container breakout
- Allows plug-in networking and rootfs management

For more information, see the [Garden-runC](#) repository on GitHub.

## Garden RootFS plug-in

Garden manages container file systems through a plug-in interface. TAS for VMs uses the Garden RootFS (GrootFS) plug-in for this task. GrootFS is a Linux-specific implementation of the Garden volume plug-in interface.

GrootFS performs the following actions:

- Creates container file systems based on buildpacks and droplets.
- Creates container file systems based on remote docker images.
- Authenticates with remote registries when using remote images.
- Properly maps UID/GID for all files inside an image.
- Runs garbage collection to remove unused volumes.
- Applies per container disk quotas.
- Provides per container disk usage stats.

For more information, see [GrootFS Disk Usage](#) and the [GrootFS repository](#) on GitHub.

## GrootFS disk usage in Cloud Foundry

This topic tells you about the concepts related to GrootFS disk space management in VMware Tanzu Application Service for VMs (TAS for VMs).

## GrootFS stores

GrootFS is the container root filesystem management component for Garden. A container root filesystem or *rootfs* is often referred to as an **image**.

A **GrootFS store** is the directory in which rootfs layers and container images are cached. This directory is configured by GrootFS and mounted on an XFS-formatted volume by the Garden job during BOSH VM creation.

Individual container root filesystems are provided via OverlayFS mounts.

Supplying GrootFS with an already formatted XFS volume for its' store is not yet supported for BOSH-controlled deployments.

## Garbage collection behavior in GrootFS stores

GrootFS stores are initialized to use the entirety of `/var/vcap/data`. If the `reserved_space_for_other_jobs_in_mb` is not set high enough, or if there are many images with few shared volumes, the store can use up all available space.

The thresholder component calculates and sets a value so that GrootFS's garbage collector can attempt to ensure that a small reserved space is kept free for other jobs. GrootFS only tries to garbage collect when that threshold is reached. However, if all the rootfs layers are actively in use by images, then garbage collection cannot occur and that space is used up.

## Volumes

Underlying layers in rootfs images are known as `volumes` in GrootFS. They are read-only and their changesets are layered together through an **OverlayFS** mount to create the root filesystems for containers.

When GrootFS writes each filesystem volume to disk, it also stores the number of bytes written to a file in a `meta` directory. The size of an individual volume is available in its corresponding metadata file. GrootFS also stores the SHA of each underlying volume used by an image in the `meta` folder.

For each container, GrootFS mounts the underlying `volumes` using overlay to a point in the `images` directory. This mount point is the rootfs for the container and is read write.

On disk, the read-write layer for each container can be found at

`/var/vcap/data/grootfs/store/unprivileged/images/CONTAINER-ID/diff` (or  
`/var/vcap/data/grootfs/store/privileged/images/CONTAINER-ID/diff` for privileged containers.)

When GrootFS calls on the built-in XFS quota tooling to get disk usage for a container, it takes into account data written to those `diff` directories and not the data in the read-only volumes.

## Volume Cleanup Example

When `clean` is called in GrootFS, any layers that are not being used by an existing rootfs are deleted from the store. The cleanup only takes into account the `volumes` folders in the store.

For example, imagine that there are two rootfs images from different base images, Image A and Image B:

```
- Image A
  Layers:
    - layer-1
    - layer-2
    - layer-3

- Image B
  Layers:
    - layer-1
    - layer-4
    - layer-5
```

They have a layer in common, layer-1. And after deleting Image B, layer-4 and layer-5 can be collected by `clean`, but not layer-1 because Image A still uses that layer.

For more information on how to calculate GrootFS disk usage in your deployment, see [Examining GrootFS Disk Usage](#).

## Additional information

For more information, see the following sections of [garden-runc-release](#):

- [overlay-xfs-setup](#)
- [grootfs-utils](#)
- [thresholder](#)

## HTTP routing

This topic tells you how the Gorouter, the main component in the VMware Tanzu Application Service for VMs (TAS for VMs) routing tier, routes HTTP traffic within TAS for VMs.

For more information about routing, see [Routing in TAS for VMs Components](#).

## HTTP headers

### Header size limit

The Gorouter has a limit of 1 MB for HTTP Headers.

The specific language, framework, and configuration of the back end app container determine the effective header size limit. For example, the default header size for the Tomcat container is 8 kB.

### X-Forwarded Proto

The [X-Forwarded-Proto](#) header gives the scheme of the HTTP request from the client.

If an incoming request includes the [X-Forwarded-Proto](#) header, the Gorouter:

- Appends it to the existing header.
- Sets the scheme to HTTP if the client made an insecure request, meaning a request on port [80](#).
- Sets the scheme to HTTPS if the client made a secure request, meaning a request on port [443](#).

Developers can configure their apps to reject insecure requests by inspecting the [X-Forwarded-Proto](#) HTTP header on incoming traffic. The header might have multiple values represented as a comma-separated list, so developers must ensure the app rejects traffic that includes any [X-Forwarded-Proto](#) values that are not HTTPS.

### X-Forwarded-For

If [X-Forwarded-For](#) is present, the Gorouter appends the load balancer's IP address to it and forwards the list. If [X-Forwarded-For](#) is not present, the Gorouter sets it to the IP address of the load balancer in the forwarded request (some load balancers masquerade the client IP). If a load balancer sends the client IP using the PROXY protocol, then the Gorouter uses the client IP address to set [X-Forwarded-For](#).

If your load balancer terminates TLS on the client side of the Gorouter, it must append these headers to requests forwarded to the Gorouter. For more information, see [Securing Traffic into TAS for VMs](#).

### HTTP headers for Zipkin tracing

Zipkin is a tracing system that allows app developers to troubleshoot failures or latency issues. Zipkin provides the ability to trace requests and responses across distributed systems. For more information about Zipkin tracing, see [Zipkin.io](#).

When Zipkin tracing is enabled in TAS for VMs, the Gorouter examines the HTTP request headers and performs the following:

- If the `X-B3-TraceId` and `X-B3-SpanId` HTTP headers are not present in the request, the Gorouter generates values for these and inserts the headers into the request forwarded to an app. The Gorouter access log message for the request includes `x_b3_traceid` and `x_b3_spanid`.
- If the `X-B3-TraceId` and `X-B3-SpanId` HTTP headers are present in the request, the Gorouter forwards them unmodified. In addition to these trace and span IDs, the Gorouter access log message for the request includes `x_b3_parentspanid`.

You can then add Zipkin trace IDs to app logs in order to trace app requests and responses in TAS for VMs.

After adding Zipkin HTTP headers to app logs, you can correlate the trace and span IDs that the Gorouter logs with the trace IDs that the app logs by running `cf logs APP-NAME`, where `APP-NAME` is the name of the app. To correlate trace IDs for a request through multiple apps, each app must forward appropriate values for the headers with requests to other apps.

For more information about Zipkin tracing, see [Enabling Zipkin Tracing](#).

## HTTP headers for W3C tracing

Similar to Zipkin, W3C is a tracing specification that allows app developers to monitor and profile requests and responses.

When W3C tracing is enabled in TAS for VMs, the Gorouter generates W3C HTTP headers unless they are provided by the client, as described in [Unique trace identification](#). For more information about W3C tracing, see the w3.org [Trace Context](#) standard.

You can add W3C trace IDs to app logs to trace app requests and responses in TAS for VMs.

After adding W3C HTTP headers to app logs, you can correlate the W3C trace IDs that the Gorouter logs with the W3C trace IDs that the app logs by running:

```
cf logs APP-NAME
```

Where `APP-NAME` is the name of the app.

To correlate W3C trace IDs for a request through multiple apps, each app must forward appropriate values for the headers with requests to other apps.

## HTTP headers for app instance routing

If you want to retrieve debug data for a specific instance of an app, you can use the HTTP header `x-cf-App-Instance` to make a request to the app instance you want to debug.

To make an HTTP request to a specific app instance:

1. In a terminal window, retrieve the global unique identifier (GUID) of your app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. From the terminal output, record the GUID of your app.
3. List your app instances and retrieve the index number of the instance you want to debug by running:

```
cf app APP-NAME
```

Where `APP-NAME` is the name of your app.

4. From the terminal output, record the the index number of the instance you want to debug.
5. Make a request to the app route by running:

```
curl APP-FQDN -H "X-Cf-App-Instance": "APP-GUID:INSTANCE-INDEX-NUMBER"
```

Where:

- `APP-FQDN` is the fully-qualified domain name (FQDN) of your app. For example, `app.example.com`.
- `APP-GUID` is the app GUID that you recorded in a previous step.
- `INSTANCE-INDEX-NUMBER` is the instance index number that you recorded in the previous step.

You can only use `X-Cf-App-Instance` header on the Diego architecture.

If either of the values you provide in the above command are invalid, Gorouter returns a `400` error, and the response from Gorouter contains a `X-Cf-Routererror` header with more information about the error. The following table describes the possible error responses:

X-Cf-Routererror Value	Reason for Error	Response Body
<code>invalid_cf_app_instance_header</code>	The value provided for <code>X-Cf-App-Instance</code> includes an incorrectly formatted app GUID.	None
<code>unknown_route</code>	The value provided for <code>X-Cf-App-Instance</code> includes a correctly formatted app GUID, but the app instance index number was not found for the requested route.	400 Bad Request: Requested instance ('1') with guid ('aaaaaaaaaaaa-aaaa-aaaa-aaaaaaaaaaaaaa') does not exist for route ('example-route.cf.example.com')



The `X-Cf-App-Instance` header is not effective for applications that have a route service configured.



The `X-Cf-App-Instance` header is not supported for multi-process apps or apps that have undergone a [rolling or canary deployment](#). For these apps, use the `X-Cf-Process-Instance` header instead.

## HTTP headers for process instance routing



The `X-Cf-Process-Instance` header requires routing-release 0.332.0 or higher.

Apps that have [multiple processes](#) or apps that have been pushed with the rolling or canary deployment strategies cannot be reliably routed to using the `X-Cf-App-Instance` header. Users who wish to route to a specific instance of these apps should use the `X-Cf-Process-Instance` header.

To make an HTTP request to a specific process instance:

1. In a terminal window, retrieve the global unique identifier (GUID) of your app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. From the terminal output, record the GUID of your app.
3. Retrieve the process GUIDs for your app by running:

```
cf curl /v3/<APP-GUID/processes
```

4. From the terminal output, record the GUID of the process you are interested in.
5. Make a request to the app route by running:

```
curl APP-FQDN -H "X-Cf-Process-Instance": "PROCESS-GUID"
curl APP-FQDN -H "X-Cf-Process-Instance": "PROCESS-GUID:INSTANCE-INDEX-NUMBER"
```

Where:

- `APP-FQDN` is the fully-qualified domain name (FQDN) of your app. For example, `app.example.com`.
- `PROCESS-GUID` is the process GUID that you recorded in a previous step.
- `INSTANCE-INDEX-NUMBER` is the \_optional\_ process instance index number. If `INSTANCE-INDEX-NUMBER` is omitted, then Gorouter routes to all instances of the process.

If either of the values you provide in the above command are invalid, Gorouter returns a `400` error, and the response from Gorouter contains a `X-Cf-Routererror` header with more information about the error. The following table describes the possible error responses:

X-Cf-Routererror Value	Reason for Error	Response Body
<code>invalid_cf_process_instance_header</code>	The value provided for <code>X-Cf-Process-Instance</code> includes an incorrectly formatted process GUID or index.	None
<code>unknown_route</code>	The value provided for <code>X-Cf-App-Instance</code> includes a correctly formatted app GUID, but the app instance index number was not found for the requested route.	<code>400 Bad Request: Requested instance ('1') with process guid ('aaaaaaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa') does not exist for route ('example-route.cf.example.com')</code>

## Forwarding client certificate to apps

Apps that require mutual TLS (mTLS) need metadata from client certificates to authorize requests. TAS for VMs supports this use case without bypassing layer-7 load balancers and the Gorouter.

The HTTP header `X-Forwarded-Client-Cert` (XFCC) might be used to pass the originating client certificate along the data path to the app. Each component in the data path must trust that the back-end component has not allowed the header to be tampered with.

If you configure the load balancer to terminate TLS and set the XFCC header from the received client certificate, you must also configure the load balancer to strip this header if it is present in client requests. This configuration is required to prevent spoofing of the client certificate.

The following sections describe supported deployment configurations.

### Terminate TLS at Load Balancer

By default, the Gorouter forwards arbitrary headers that are not otherwise mentioned in the docs. This includes the XFCC header.

For apps to receive the XFCC header, configure your load balancer to set the XFCC header with the contents of the client certificate received in the TLS handshake.

To enable this mode:

1. Go to Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Networking**.
4. Under **TLS termination point**, select **Infrastructure load balancer**.

### Terminate TLS at the Gorouter

If the Gorouter is the first component to stop TLS, such that it receives the certificate of the originating client in the mutual TLS handshake, select this option. When selected, the Gorouter sets the XFCC header to the contents of the client certificate received in the TLS handshake and strips the XFCC header when present in a request.

This option requires you to configure the load balancer in front of the Gorouter to pass through TLS handshake to the Gorouter through TCP.

To enable this mode:

1. Go to Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Networking**.
4. Under **TLS termination point**, select **Gorouter**.

The Gorouter trusts the Diego intermediate certificate authority. This trust is enabled automatically and permits mutual authentication between apps running on Operations Manager.

## Client-Side TLS

Depending on your needs, you can configure your TAS for VMs deployment to terminate TLS at the Gorouter, at the Gorouter and the load balancer, or at the load balancer only. For more information, see [Securing Traffic into TAS for VMs](#).

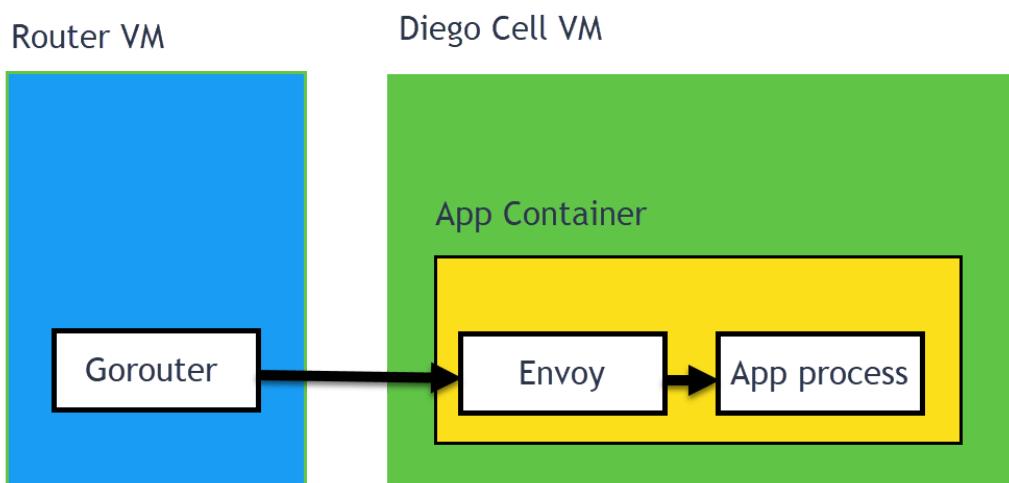
## TLS to apps and other back end services

The Gorouter supports TLS and mutual authentication to back-end destinations, including app instances, platform services, and any other routable endpoints.

This has the following benefits:

- Improved availability for apps by keeping routes in the Gorouter's routing table when TTL expires
- Increased guarantees against mis-routing by validating the identity of back ends before forwarding requests
- Increased security by encrypting data in flight from the Gorouter to back ends

The TLS (or MTLS) traffic from Gorouter to the app backend “just works.” There is nothing that the app has to do. Gorouter does not talk directly to the backend app, but communicates with the Envoy sidecar. There is an Envoy sidecar in every app container. The Envoy sidecar has the correct certificates needed, so Gorouter and the Envoy communicate using TLS (or MTLS, depending on the configuration). Then the Envoy sidecar proxies the unencrypted traffic directly to the app process. For more information, see [Envoyproxy.io](#).



## Preventing mis-routes

As TAS for VMs manages and balances apps, the internal IP address and ports for app instances change. To keep the Gorouter's routing tables current, a Route-Emitter on each Diego Cell sends periodic messages for each app instance running on that Diego Cell to all Gorouters through NATS. Each message includes the location and a unique identifier for the app instance to verify its identity when using TLS to communicate with the instance.

Network partitions or NATS failures can cause the Gorouter's routing table to fall out of sync, as TAS for VMs continues to re-create containers across hosts to keep apps running. This can lead to routing of requests to incorrect destinations.

Before forwarding traffic to an app instance, the Gorouter initiates a TLS handshake with an Envoy proxy running in each app container. In the TLS handshake, the Envoy proxy presents a certificate generated by Diego for each container that uniquely identifies the container using the same app instance identifier sent by the Route-Emitter, configured in the certificate as a domain Subject Alternative Name (SAN). For more information, see [Envoyproxy.io](#).

If the Gorouter confirms that the app instance identifier in the certificate matches the one received in the route registration message, the Gorouter forwards the HTTP request over the TLS session, and the Envoy proxy then forwards it to the app process. If the instance identifiers do not match, the Gorouter removes the app instance from its routing table and transparently retries another instance of the app.

Currently, only Linux cells support the Gorouter validating app instance identities using TLS by default. With Windows cells, the Gorouter connects to back ends without TLS, forwarding requests to Windows apps over plain text and pruning based on route TTL.

## Configuring validation of app instance identity with TLS

Verifying app identity using TLS improves resiliency and consistency for app routes.

The **App Containers** pane of the TAS for VMs tile includes these options under **Gorouter app identity verification**:

- **The Gorouter uses TLS to verify app identity:** The Gorouter verifies app identity using TLS. This option is selected by default.
- **The Gorouter and apps use mutual TLS to verify each other's identity:** The Gorouter and your apps verify each other's identity using TLS.



If you configure mutual TLS app identity verification, app containers accept incoming communication only from the Gorouter. This deactivates TCP routing.

To allow TLS communications to back ends running on Windows cells, you can configure the same options under **Gorouter app identity verification (beta)** in the **Advanced Features** pane of the VMware Tanzu Application Service for VMs [Windows] (TAS for VMs [Windows]) tile.

## Router balancing algorithm

Gorouter can be configured to use different load balancing algorithms for routing incoming requests to app instances. The Gorouter maintains a dynamically updated list of app instances for each route. Depending on which algorithm is selected, it forwards to one of the app instances.

As a platform operator, you can configure the behavior by changing the value of `router.balancing_algorithm` manifest property.

The possible options:

- `round-robin`. For more information, see [Round-Robin Load Balancing](#).
- `least-connection`. For more information, see [Least-Connection Load Balancing](#).

By default, the Gorouter uses the round-robin algorithm.

The balancing algorithm behavior can optionally be further fine-tuned by changing the value of `router.balancing_algorithm_az_preference` to either of the following options:

- `none`
- `locally-optimistic`

By default, the Gorouter's balancing algorithm availability zone preference is None. We do not recommend changing this value. For more information about these values, see [Load Balancing AZ Preference](#).

## Round robin load balancing

Incoming requests for a given route are forwarded to all app instances one after another, looping back to the first one after they have each received a request. This algorithm is suitable for most use cases and evenly distributes the load between app instances.

## Least connection load balancing

Each request for a given route is forwarded to the app instance with the least number of open connections. This algorithm can be more suitable for some cases. For example, if app instances have long-lived connections and are scaled up, then new instances receive fewer connections, causing a disproportionate load. In this case, choosing a least-connection algorithm sends new connections to new instances to equalize the load.

## Load balancing availability zone preference

The Gorouter has the ability to try to pick from app instances that are present in the same availability zone as the Gorouter itself. By default, the Gorouter has no preference, and will use the configured balancing algorithm across all possible app instances in all existing availability zones.

If the gorouter availability zone preference is set to `locally-optimistic`, then for each request, on the initial attempt to pick an app instance, the Gorouter will use the configured balancing algorithm across all instances in the same availability zone as the Gorouter itself. Subsequent retries, in the case of failure or unavailability, will use instances in all available availability zones.

## WebSockets

WebSockets is a protocol providing bi-directional communication over a single, long-lived TCP connection, commonly implemented by web clients and servers. WebSockets are initiated through HTTP as an upgrade request. The Gorouter supports this upgrade handshake and holds the TCP connection open with the selected app instance.

To support WebSockets, the operator must configure the load balancer correctly. Depending on the configuration, clients may have to use a different port for WebSocket connections, such as port 4443, or a different domain name. For more information, see [Supporting WebSockets](#).

## Session affinity

Gorouter supports session affinity, or *sticky sessions*, for incoming HTTP requests to compatible apps.

With sticky sessions, when multiple instances of an app are running on TAS for VMs, requests from a particular client always reach the same app instance. This allows apps to store session data specific to a user session.

To support sticky sessions, configure your app to return a sticky session cookie in responses. The default value for this field is `JSESSIONID`. You can configure the cookie names that the routing tier uses for sticky sessions. To configure the names of the cookies, see [Configure Networking](#) in *Configuring TAS for VMs*.

If an app returns a sticky session cookie to a client request, the TAS for VMs routing tier generates a unique `VCAP_ID` for the app instance based on its GUID with the same expiry, sameSite, and secure attributes as `JSESSIONID`. For example:

```
323f211e-fa3-4161-9bd1-615392327913
```

On subsequent requests, the client must provide both the sticky session and `VCAP_ID` cookies.

CF routing tier uses the `VCAP_ID` cookie to forward client requests to the same app instance every time. The sticky session cookie is forwarded to the app instance to enable session continuity. If the app instance identified by the `VCAP_ID` crashes, the Gorouter attempts to route the request to a different instance of the app. If the Gorouter finds a healthy instance of the app, it initiates a new sticky session.

TAS for VMs does not persist or replicate HTTP session data across app instances. If an app instance crashes or is stopped, the session data for that instance is lost. If you require session data to persist across crashed or stopped instances, or to be shared by all instances of an app, store the session data in a TAS for VMs marketplace service that offers data persistence.

For more information, see [Session Affinity](#) on GitHub.

## Keep alive connections

### Front end clients

Gorouter supports keep alive connections from clients and does not close the TCP connection with clients immediately after returning an HTTP response. Clients are responsible for closing these connections.

### Back end servers

If keep-alive connections are disallowed, the Gorouter closes the TCP connection with an app instance or system component after receiving an HTTP response.

If keep-alive connections are allowed, the Gorouter maintains established TCP connections to back ends. The Gorouter supports up to 100 idle connections to each back end:

- If an idle connection exists for a given back end, the Gorouter reuses it to route subsequent requests.
- If no idle connection exists for this back end, the Gorouter creates a new connection.

## Transparent retries

If the Gorouter cannot establish a TCP connection with a selected app instance, the Gorouter considers the instance ineligible for requests for 30 seconds and transparently attempts to connect to another app

instance. Once the Gorouter has established a TCP connection with an app instance, the Gorouter forwards the HTTP request.

When you deploy an app that requires Diego Cells to restart or recreate, the app might not respond to a Gorouter request before the keep-alive connection breaks. The following table describes how the Gorouter behaves if it cannot establish a TCP connection to an app:

If the Gorouter...	and the back end...	then the Gorouter...
cannot establish a TCP connection to a back end	N/A	retries another back end no more than three times (3 times is the default. Operators can configure a different maximum.)
establishes a TCP connection to a back end and forwards the request	does not respond	waits 15 minutes for a response, and if it receives an error, does not retry another back end
establishes a TCP connection to a back end and forwards the request	returns a TCP connection error	returns an error to the client, marks the back end ineligible, and does not retry another back end

In all cases, if the app still does not respond to the request, the Gorouter returns a [502](#) error. For more information, see [Troubleshooting Router Error Responses](#).

## User Accounts and Authentication overview

Cloud Foundry User Account and Authentication (UAA) is an open-source identity server project under the Cloud Foundry Foundation.

UAA provides enterprise-scale identity management features. It is used by these commercial services, for example:

- [Single sign-on for VMware Tanzu](#): Identity services for apps and APIs running on VMware Tanzu Application Service (TAS for VMs)
- [SAP Cloud Identity Services](#)

## What is UAA?

UAA provides identity based security for apps and APIs. It supports open standards for authentication and authorization, including:

- OAuth
- OpenID Connect
- SAML
- LDAP
- SCIM

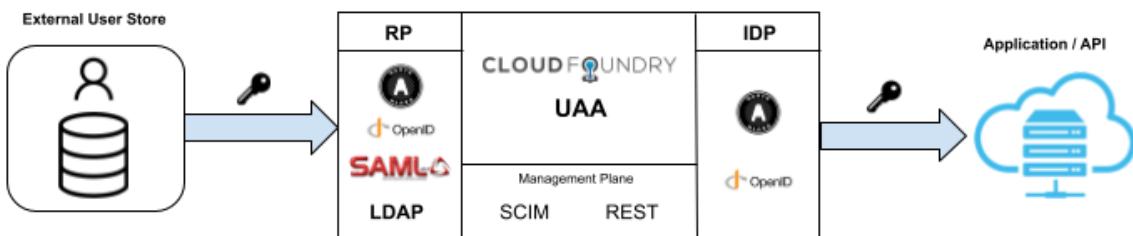
The major features of UAA include:

- User Single Sign-On (SSO) using federated identity protocols
- API security with OAuth
- User and group management
- Multi-tenancy support

- Support for **JWT** and **opaque** as a token format
- Token revocation
- Operational flexibility
  - Operate and run as a **BOSH release**, which uses multi-cloud deployment capabilities
  - Push as an app to TAS for VMs
- Database flexibility, including support for MySQL and Postgres
- Auditing, logging, and monitoring
- Token exchange for SAML and JWT bearers
- Rest APIs for authentication, authorization, and configuration management

## UAA architecture

The following diagram illustrates the architecture of UAA:



The following table describes the protocols UAA can use:

Protocol	Purpose	Profiles
OAuth 2.0	Authorizes apps and APIs	Authorization Server, Relying Party
OpenID Connect 1.0	Federates to external identity providers (IDPs) and acts as an IDP for SSO	Identity Provider, Relying Party
SAML 2.0	Federates to external IDPs	Service Provider
LDAP	Authenticates users in external user store	LDAP Client
SCIM 1.0	Manages users and groups	Identity Provisioning

## Client-side tools and libraries

The following table describes the client-side tools and libraries UAA uses:

Name	Language
UAAC	Ruby
CF-UAA-LIB	
Spring Security OAuth	Java

Name	Language
CF Java Client	Java
UAA Javascript SDK (Singular)	JS

## The role of UAA in securing TAS for VMs

TAS for VMs relies on UAA for identity and access management requirements. UAA secures user and system access to TAS for VMs installations.

Since TAS for VMs is primarily used in the enterprise context, UAA supports enterprise SSO workflows. If you have already authenticated against the enterprise IDP, you can access TAS for VMs without entering credentials again.

Some of the major components of TAS for VMs that use UAA include:

- Cloud Controller
- Gorouter
- Loggregator
- Container networking

Each of these components expose APIs for user and system interaction. UAA uses OAuth to secure the APIs exposed by core TAS for VMs components.

UAA secures many different TAS for VMs components, including:

- Cloud Foundry Command Line Interface (cf CLI)
- Cloud Controller
- Loggregator
- Notifications
- Gorouter
- Container Networking
- Diego
- BOSH Director
- Autoscaler

## Token management

After authenticating, client apps access resources and services using tokens rather than account authentication credentials. UAA generates, manages, distributes, and validates these tokens. UAA provides new tokens only to client apps with valid authentication credentials.

Once granted, token validity is unchallenged until the token expires due to timeout.

UAA distributes two types of tokens: access tokens and refresh tokens.

### Access tokens

Client apps use UAA provided access tokens to request access to API endpoints, resources, and services. The access token presented by a client app must be valid in order to access a resource.

Access tokens are valid for a short period of time.

After a UAA-provided access token has expired, a client app can request UAA provide a replacement. To request a replacement access token from UAA, a client app must present a valid refresh token.

## Refresh tokens

Client apps use UAA-provided refresh tokens to request replacements for expired access tokens. The refresh token presented by a client app must be valid in order to replace an expired access token.

Refresh tokens are valid for a long period of time.

UAA does not provide replacement refresh tokens. To obtain a new refresh token, a client app must re-authenticate.

## Token timeouts

The token interactions that are listed previously produce certain end results.

Authenticated client apps are running and interacting with services using tokens, not the service account's authentication. An admin can revoke a service account's access and privileges, but a client app running under that service account can continue to interact with the environment, unchallenged, as long as its token is valid. Therefore:

- The access token timeout is the maximum period during which an already running app can continue to access services after an admin has revoked privileges from the service account the app is running under.
- The refresh token timeout is the maximum period during which a client app can access services without re-authentication.

The default access and refresh token timeout values are the UAA token timeout values VMware recommends. Before altering token timeout settings, consider:

- Short default token timeout periods create overhead within your system.
  - A short access token timeout requires a client app to frequently request a replacement access token from the UAA server.
  - A short refresh token timeout requires frequent re-authentication, which might be impossible at the designated timeout frequency.
- Long timeout periods represent a security risk.
  - A long access token timeout allows an authenticated process to continue accessing services and resources for a long period after an admin has revoked privileges from the service account used by the process.
  - A long refresh token timeout allows an already authenticated app to continue running for a long period of time on stale authentication credentials without being challenged to re-authenticate.

Setting a long timeout period, such as one lasting days, can result in a client app running unchallenged for days.

## Services

This topic tells you about the services in VMware Tanzu Application Service for VMs (TAS for VMs).

### Services and service instances

TAS for VMs offers a marketplace of services that operators can use to provision reserved resources on demand. Marketplace services include resources such as databases on a shared or dedicated server, or accounts on a SaaS app. These resources are known as service instances and the systems that deliver and operate these resources are known as services.

For a service to be available in the Marketplace, an operator must integrate the service with TAS for VMs using APIs.

For more information about provisioning service instances and other life cycle operations, see [Managing Service Instances](#).

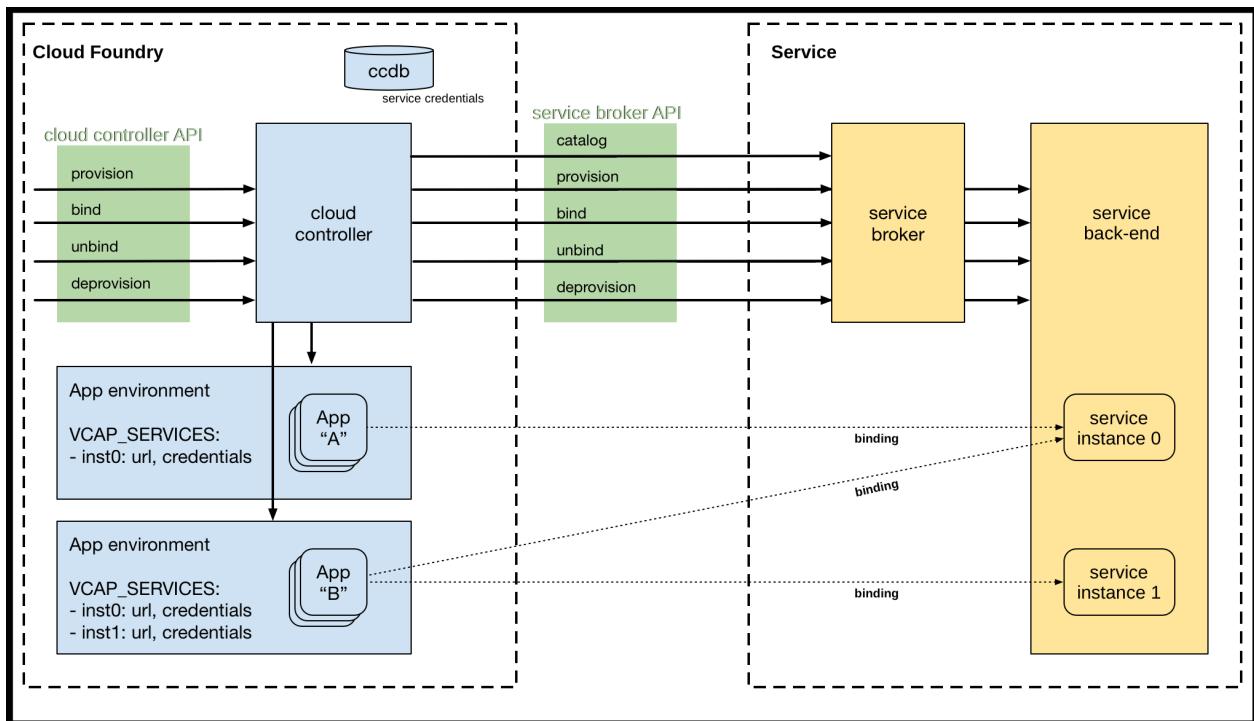
TAS for VMs enables users to use services that are not available in the Marketplace using user provided service instances (UPSI). For more information, see [User-Provided Service Instances](#).

### Architecture and terminology

Services are integrated with TAS for VMs by using a documented API for which the Cloud Controller is the client, called the Service Broker API. This cannot be confused with the Cloud Controller API (CAPI), often used to refer to the version of Cloud Foundry. The Service Broker API is versioned independently of CAPI.

The component of the service that uses the Service Broker API is called the *service broker*. This component was formerly referred to as a service gateway. However, as traffic between apps and services does not flow through the service broker, the term caused confusion. Although “gateway” still appears in old code, the term “broker” is used in conversation, in new code, and in documentation.

Service brokers advertise a catalog of service offerings and service plans, as well as interpreting calls for provision, bind, unbind, and deprovision. What a broker does with each call can vary between services. In general, ‘provision’ reserves resources on a service and ‘bind’ delivers information to an app necessary for accessing the resource. The reserved resource is called a *service instance*. What a service instance represents can vary by service. It could be a single database on a multi-tenant server, a dedicated cluster, or even an account on a web app.



## Service Instance credentials

TAS for VMs enables users to provision credentials needed to interface with a service instance. You can use app binding to deliver these credentials to your TAS for VMs app. For external and local clients, you can use service keys to generate credentials to communicate directly with a service instance.

### Binding Apps

Service instance credentials can be delivered to apps running on TAS for VMs in an environment variable. For more information, see [Delivering Service Credentials to an App](#).

For information about binding to a specific app development framework, see [Using Classic Buildpacks in Cloud Foundry](#).

### Service keys

Credentials managed manually are known as service keys. Use service keys when you want a set of credentials for use by clients other than the app in the same space. For instance, you can use service keys to connect to a service instance from a local client, or from an app in another space, or even from outside of TAS for VMs.

For more information about creating a user-provided service instance with service keys, see the [User-Provided Service Instances](#) topic. For more information about service keys, see the [Managing Service Keys](#) topic.

Not all services support service keys. Some services support credentials through app binding only.

## Implementation and deployment

How a service is implemented is up to the service provider or developer. TAS for VMs only requires that the service provider implement the Service Broker API. A broker can be implemented as a separate app, or by

adding the required HTTP endpoints to an existing service.

Because TAS for VMs only requires that a service implements the Service Broker API to be available to TAS for VMs end users, many deployment models are possible. The following are examples of valid deployment models:

- Entire service packaged and deployed by BOSH alongside TAS for VMs
- Service broker packaged and deployed by BOSH alongside TAS for VMs, rest of the service deployed and maintained by other means
- Broker (and optionally service) pushed as an app to TAS for VMs user space
- Entire service, including broker, deployed and maintained outside of TAS for VMs by other means

## Communication between Apps and Service Instances

To allow an app to communicate with a service external to TAS for VMs, you might need to configure the service to accept connections from your app based on its outbound IP address.

In your external service configuration, you must do one of the following:

- Add the entire IP address range for the Diego Cell where the app is deployed to your allow list.
- Derive the app IP address from its DNS name using a command-line tool such as `dig`, `host`, or `nslookup`. In your external service configuration, add the IP address or range of the app instance to your allow list.

## Streaming App Logs to Log Management Services

To learn how your app logs can be streamed to third-party log management services, see [Streaming App Logs to Log Management Services](#).

User provided service instances can be used to drain app logs to a service not available in the Marketplace. This is also known as setting up a syslog drain. For guidance on configuring some third party log management services, see [Service-Specific Instructions for Streaming App Logs](#).

## Managing App Requests with Route Services

To learn how Marketplace services (and user-provided service instances) can be used to perform preprocessing on app requests, see [Managing App Requests with Route Services](#).

## Migrating a Database Schema

If your app relies on a relational database, you must apply schema changes periodically. To perform database schema migrations on TAS for VMs-managed services, run a database migration task with the TAS for VMs Command Line Interface (cf CLI) tool.

For more information about running cf CLI tasks, see [Running Tasks](#).

To run tasks with the cf CLI, you must install cf CLI v6.23.0 or later. For information about downloading, installing, and uninstalling the cf CLI, see [Installing the cf CLI](#).

To run a database schema migration with the cf CLI:

1. Push the app:

```
$ cf push APP-NAME
```

Where `APP-NAME` is the name of the app.

To run a task without starting the app, you can push the app with `cf push -i 0` and then run the task. You can run the app later by scaling up the instance count.

2. Run database schema migration as a task on the app:

```
$ cf run-task APP-NAME --command "bin/rails db:migrate" --name TASK-NAME
E
Creating task for app APP-NAME in org jdoe-org / space development as j
doe@pivotal.io...
OK
Task 1 has been submitted and ran successfully.
```

Where:

- `APP-NAME` is the name of the app.
- `TASK-NAME` is the name of the task.

## CredHub

Learn about the functionality of the CredHub component.

CredHub is a component designed for centralized credential management in Operations Manager. It's a single component that can address several scenarios in the Operations Manager ecosystem. At the highest level, CredHub centralizes and secures credential generation, storage, lifecycle management, and access.

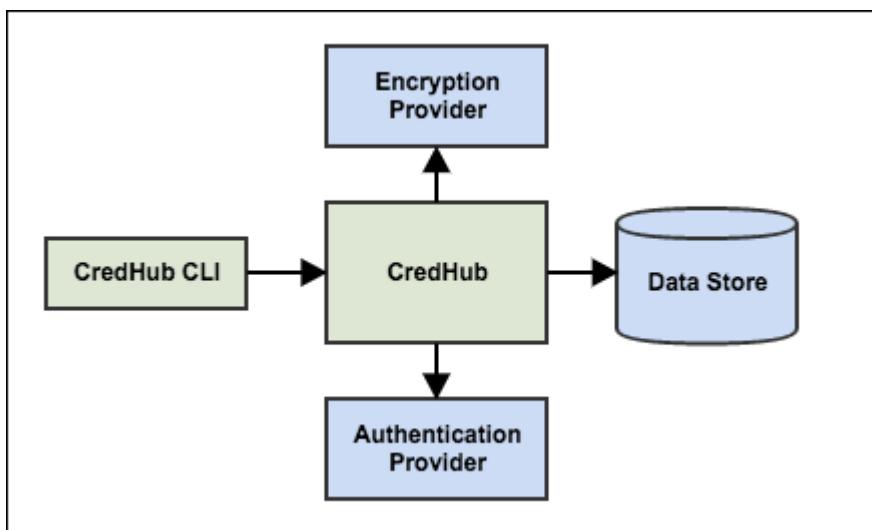
## Functions

CredHub performs a number of different functions to help generate and protect the credentials in your Operations Manager deployment:

- Securing data for storage
- Authentication
- [Authorization and Permissions](#)
- Access and change logging
- Data typing
- Credential generation
- Credential metadata
- Credential versioning

## App architecture

CredHub consists of a REST API and a CLI. CredHub is an OAuth2 resource server that integrates with User Account Authentication (UAA) to provide core authentication and federation capabilities.



## CredHub in Operations Manager

A Operations Manager deployment stores credentials in the following locations:

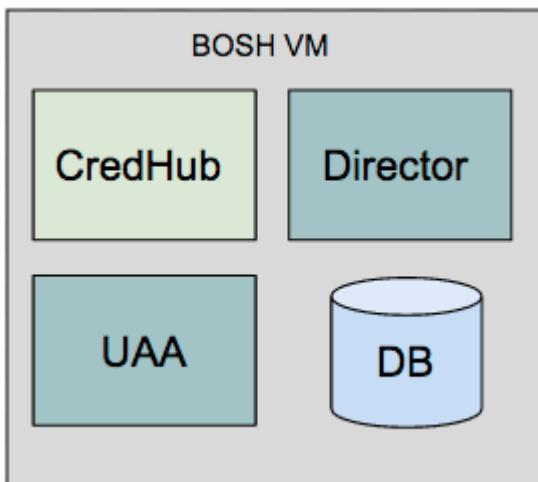
- **BOSH CredHub:** Colocated with the BOSH Director on a single VM. This CredHub instance stores credentials for the BOSH Director.
- **Runtime CredHub:** Deployed as an independent service and stores service instance credentials.

### BOSH CredHub

In Operations Manager, the BOSH Director VM includes a CredHub job. This provides a lightweight credential storage instance for the BOSH Director. The BOSH Director, VMware Tanzu Application Service for VMs (TAS for VMs), and other tiles store credentials in BOSH CredHub. For more information, see *Retrieve Credentials Stored in BOSH CredHub* in *Retrieving Credentials from Your Deployment*.

This configuration does not provide high availability.

In this colocated deployment architecture, the BOSH Director, CredHub, UAA, and the BOSH Director database are all installed on a single BOSH VM, as shown in the following diagram:



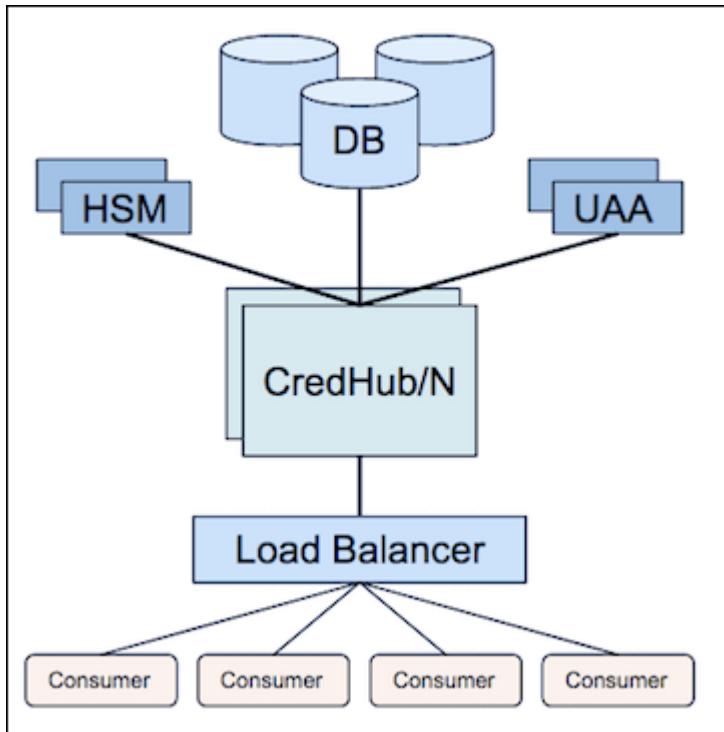
## Runtime CredHub

The TAS for VMs tile deploys CredHub as an independent service on its own VM. This provides a highly available credential storage instance for securing service instance credentials.

For more information, see [Securing Service Instance Credentials with Runtime CredHub](#).

CredHub is a stateless app, so you can scale it to multiple instances that share a common database cluster and encryption provider.

With CredHub as a service, the load balancer and external databases communicate directly with the CredHub VMs, as shown in the following diagram:



## Using CredHub to store credentials for service tiles

If you develop a service tile for Operations Manager and want to store its credentials in BOSH CredHub, see [CredHub in \*Operations Manager Tile Developer Guide\*](#).

## CredHub credential types

Credentials exist in multiple places. Components use credentials to authenticate connections between components. Installations often have hundreds of active credentials. Leaked credentials are common causes of data and security breaches, so managing them securely is very important.

For more information, see [CredHub Credential Types](#).

## Backing up and restoring CredHub instances

CredHub does not hold state, but you must ensure its dependent components are backed up. Redundant backups can help prevent data loss if an individual component fails.

For more information, see [Backing Up and Restoring CredHub Instances](#).

# App Management

In this section:

- [How apps are staged](#)
- [The app container lifecycle on Diego architecture](#)
- [How Diego balances app processes](#)
- [High availability in TAS for VMs](#)
- [How TAS for VMs maintains high availability](#)
- [TAS for VMs security](#)
- [General Data Protection Regulation \(GDPR\) and TAS for VMs](#)

## Staging your apps in Cloud Foundry

This topic tells you how Diego stages buildpack apps and Docker images in VMware Tanzu Application Service for VMs (TAS for VMs).

TAS for VMs uses Diego to manage app containers. It is a self-healing system that attempts to keep the correct number of instances running in Diego Cells to avoid network failures and crashes. For more information about Diego, see [Diego Components and Architecture](#).

Learn about tasks and long-running processes (LRPs).

For more information about these, see the [Tasks and Long-Running Processes](#) section of the *How Diego Balances App Processes* topic.

To better understand the flow and caching of source bits during staging, see the [How Staging Uses the Blobstore](#) section of the *Cloud Controller blobstore* topic.

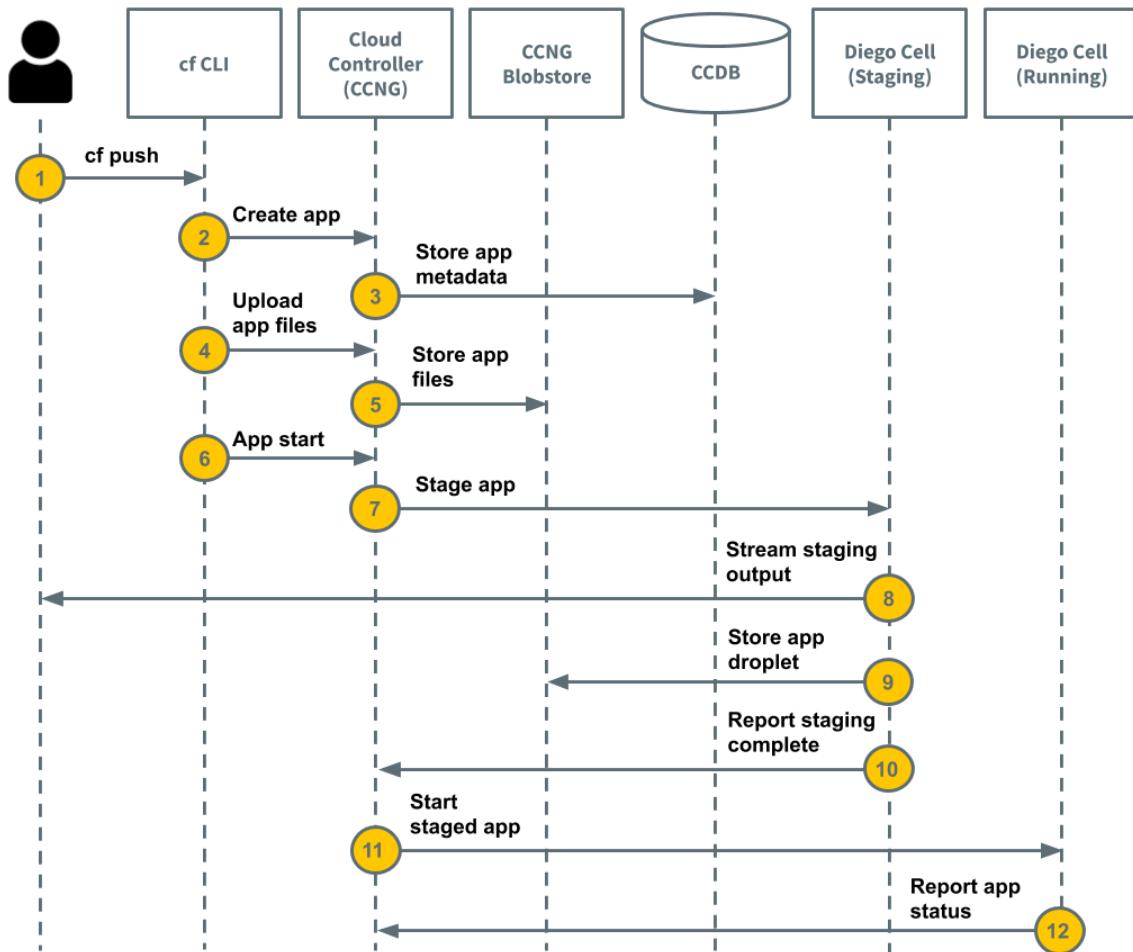
## How Diego stages buildpack apps

Learn how Diego stages buildpack apps.

The following diagram illustrates the steps and components involved in the process of staging a buildpack app. The staging process for buildpack apps includes a developer and the following components: CF Command Line, Cloud Controller (CCNG), CCNG Blobstore, CCDB, Diego Cell (Staging), and Diego Cell (Running).

- Step 1: cf push from Developer to CF Command Line.
- Step 2: Create App from CF Command Line to Cloud Controller (CCNG).
- Step 3: Stores App Metadata from CCNG to the CCDB.
- Step 4: Upload App Files from the CF Command Line to CCNG.
- Step 5: Store App Files from CCNG to CCNG Blobstore.
- Step 6: App Start from CF Command Line to CCNG.
- Step 7: Stage App from CCNG to Diego Cell (Staging).
- Step 8: Stream Staging Output from Diego Cell (Staging) to the Developer.

- Step 9: Store App Droplet from Diego Cell (Staging) to CCNG Blobstore.
- Step 10: Report Staging Complete from Diego Cell (Staging) to CCNG.
- Step 11: Start Staged App from CCNG to Diego Cell (Running).
- Step 12: Report App Status from Diego Cell (Running) to CCNG.



The following steps describe the process of staging a buildpack app:

1. A developer runs `cf push`.
2. Cloud Foundry Command Line Interface (cf CLI) tells the Cloud Controller to create a record for the app. For more information about the Cloud Controller, see [Cloud Controller](#).
3. Cloud Controller stores the app metadata. App metadata can include the app name, number of instances, buildpack, and other information about the app.
4. This step includes:
  - a. The cf CLI requests a resource match from the Cloud Controller.
  - b. The cf CLI uploads the app source files, omitting any app files that already exist in the resource cache.
  - c. The Cloud Controller combines the uploaded app files with files from the resource cache to create the app package.

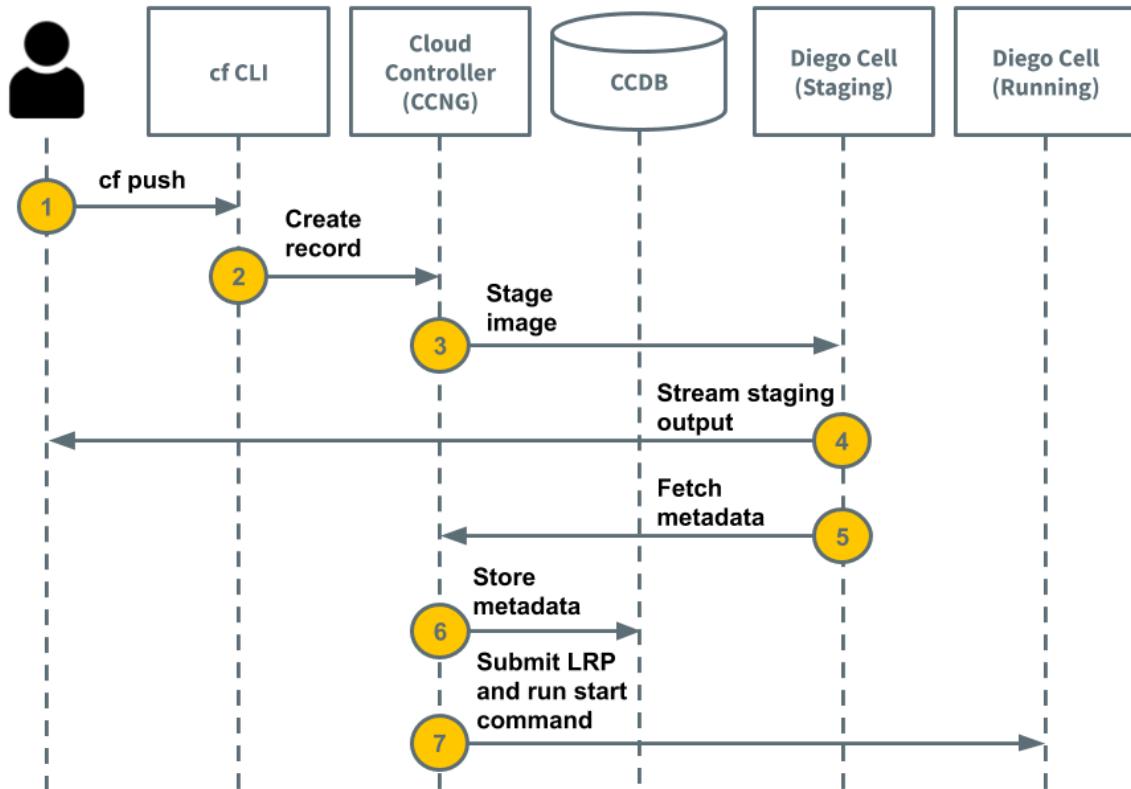
5. Cloud Controller stores the app package in the blobstore. For more information, see the [Blobstore](#) section of the *TAS for VMs Components* topic.
6. The cf CLI issues a request to start the app.
7. This step includes:
  - a. The Cloud Controller issues a staging request to Diego.
  - b. Diego schedules a Diego Cell to run the staging task.
  - c. The task downloads buildpacks and the app buildpack cache, if present.
  - d. The task uses the buildpack to compile and stage the app.
8. Diego Cell streams the output of the staging process. You might need to view the output to troubleshoot staging problems.
9. This step includes:
  - a. The task creates a tarball, or droplet, with the compiled and staged app.
  - b. The Diego Cell stores the droplet in the blobstore.
  - c. The task uploads the buildpack cache to the blobstore for use the next time the app is staged.
10. Diego Bulletin Board System (BBS) reports to the Cloud Controller that staging is complete. If staging does not complete within 15 minutes, it fails.
11. Diego schedules the app as a LRP on one or more Diego Cells.
12. Diego Cells report the status of the app to the Cloud Controller.

## How Diego stages Docker images

This section describes how Diego stages Docker images.

The following diagram illustrates the steps and components involved in the process of staging a Docker image. The staging process for Docker images includes a developer and the following components: CF Command Line, Cloud Controller (CCNG), CCDB, Diego Cell (Staging), and Diego Cell (Running).

- Step 1: CF Push from Developer to CF Command Line.
- Step 2: Create Record from CF Command Line to CCNG.
- Step 3: Stage Image from CCNG to CCDB.
- Step 4: Stream Staging Output from Diego Cell (Staging) to Developer.
- Step 5: Fetch Metadata from Diego Cell (Staging) to CCNG.
- Step 6: Store Metadata from CCNG to CCDB.
- Step 7: Submit LRP an Run Start Command from CCNG to Diego Cell (Running).



The following describe each step in the process of staging a Docker image:

1. A developer runs `cf push` and includes the name of a Docker image in an accessible Docker Registry.
2. The cf CLI tells the Cloud Controller to create a record for the Docker image.
3. This step includes:
  - a. The Cloud Controller issues a staging request to Diego.
  - b. Diego schedules a Diego Cell to run the task.
4. Diego Cell streams the output of the staging process. You might need to view the output to troubleshoot staging problems.
5. The task fetches the metadata associated with the Docker image and returns a portion of it to the Cloud Controller.
6. Cloud Controller stores the metadata in the Cloud Controller database.
7. This step includes:
  - a. Cloud Controller uses the Docker image metadata to construct a LRP that runs the start command specified in the Dockerfile.
  - b. Cloud Controller submits the LRP to Diego.
  - c. Diego schedules the LRP on one or more Diego Cells.
  - d. Cloud Controller instructs Diego and the Gorouter to route traffic to the Docker image.

Cloud Controller takes into account any user-specified overrides specified in the Dockerfile, such as environment variables.

# The app container lifecycle on Diego architecture

The life cycle stages of an application container for your VMware Tanzu Application Service for VMs (TAS for VMs) deployments running on the Diego architecture include deployment, failure events, evacuation, and shutdown.

## Deployment

App deployment involves uploading, staging, and starting the app in a container. Your app must complete each of these phases within a certain time limit. The default time limits for the phases are:

- Upload: 15 minutes
- Stage: 15 minutes
- Start: 60 seconds

Your administrator can change these default settings. Check with your administrator for the actual time limits set for app deployment.

Developers can change the time limit for starting apps through an app manifest or on the command line. For more information, see [Deploying with app manifests](#) and [Using app health checks](#).

## Crash events

If an app instance fails, TAS for VMs restarts it by rescheduling the instance on another container three times. After three failed restarts, TAS for VMs waits 30 seconds before attempting another restart. The wait time doubles each restart until the ninth restart, and remains at that duration until the 200th restart. After the 200th restart, TAS for VMs stops trying to restart the app instance.

## Evacuation

Some actions require restarting VMs with containers hosting app instances. For example, you can update stemcells or install a new version of TAS for VMs. You must restart all the VMs in a deployment.

TAS for VMs relocates the instances on VMs that are shutting down through a process called evacuation. TAS for VMs recreates the app instances on another VM, waits until they are healthy, and then shuts down the old instances. During an evacuation, you might see the app instances in a duplicated state for a brief time.

During app duplication, singleton app instances might become temporarily unavailable if the replacement instance does not become healthy within the evacuation timeout of the Diego Cell (the default is ten minutes). App developers with a low tolerance for downtime might prefer to run several instances of their app. See [Run multiple instances to increase availability](#).

## Shutdown

TAS for VMs requests a shutdown of your app instance when:

- A user runs `cf scale`, `cf stop`, `cf push`, `cf delete`, or `cf restart-app-instance`.
- A system event occurs, such as the replacement procedure during Diego Cell evacuation or when an app instance stops because of a failed health check probe.

To stop the app, TAS for VMs sends the app process in the container a SIGTERM. By default, the process has ten seconds to shut down gracefully. If the process has not exited after ten seconds, TAS for VMs sends a SIGKILL.

By default, apps must finish their in-flight jobs within ten seconds of receiving the SIGTERM before TAS for VMs stops the app with a SIGKILL. For example, a web app must finish processing existing requests and stop accepting new requests. To change the timeout period on the TAS for VMs tile or IST tile, go to the **Advanced Settings** tab and edit the “app graceful shutdown period” property. This might increase the time it takes to drain Diego Cells, which causes increased deployment time.

If your apps require a longer period of time to finish in-flight jobs and gracefully shut down, you can increase the graceful shutdown period. For more information, see [Configure Advanced Features](#) in *Configuring TAS for VMs*.



An exception to the cases previously mentioned is when monit restarts a Diego Cell replacement or Garden server that has failed. In this case, TAS for VMs immediately stops the apps that are still running using SIGKILL.

## How Diego balances app processes

Diego balances app processes over the virtual machines (VMs) in a TAS for VMs installation using the Diego Auction. When new processes need to be allocated to VMs, the Diego Auction determines which ones must run on which physical machines. The auction algorithm balances the load on VMs and optimizes app availability and resilience. This topic explains how the Diego Auction works.

For more information, see [Diego Components and Architecture](#) and the [Auction](#) repository on GitHub.

## Tasks and long running processes

Diego Auction distinguishes between two types of jobs: **Tasks** and **Long-Running Processes** (LRPs).

- **Tasks** run once, for a finite amount of time. A common example is a staging task that compiles an app’s dependencies, to form a self-contained droplet that makes the app portable and runnable on multiple VMs. Other examples of tasks include making a database schema change, bulk importing data to initialize a database, and setting up a connected service.
- **Long-Running Processes** run continuously, for an indefinite amount of time. LRPCs terminate only if they crash or are stopped. Examples include web servers, asynchronous background workers, and other applications and services that continuously accept and process input. To make high-demand LRPCs more available, Diego might allocate multiple instances of the same application to run simultaneously on different VMs, often spread across Availability Zones that serve users in different geographic regions.

Diego Auction process is repeated whenever new jobs need to be allocated to VMs. Each auction distributes a current **batch** of work, Tasks and LRPCs, that can include newly created jobs, jobs left unallocated in the previous auction, and jobs left orphaned by failed VMs. Diego does not redistribute jobs that are already running on VMs. Only one auction can take place at a time, which prevents placement collisions.

## Ordering the auction batch

Diego Auction algorithm allocates jobs to VMs to fulfill the following outcomes, in decreasing **priority** order:

1. Keep at least one instance of each LRP running.
2. Run all of the Tasks in the current batch.
3. Distribute as much of the total desired LRP load as possible over the remaining available VMs, by spreading multiple LRP instances broadly across VMs and their Availability Zones.

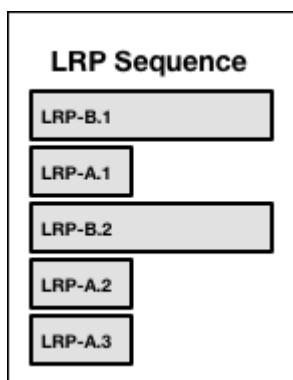
To achieve these outcomes, each auction begins with the Diego Auctioneer component arranging the batch jobs into a priority order. Some of these jobs might be duplicate instances of the same process that Diego needs to allocate for high-traffic LRPs to meet demand. The Auctioneer creates a list of multiple LRP instances based on the desired instance count configured for each process.

For more information, see the [Step 2: Passing a request to the auctioneer process](#) section of the *Diego Components and Architecture* topic.

For example, if the process LRP-A has a desired instance count of 3 and a memory load of 2, and process LRP-B has 2 desired instances and a load of 5, the Auctioneer creates a list of jobs for each process as follows:

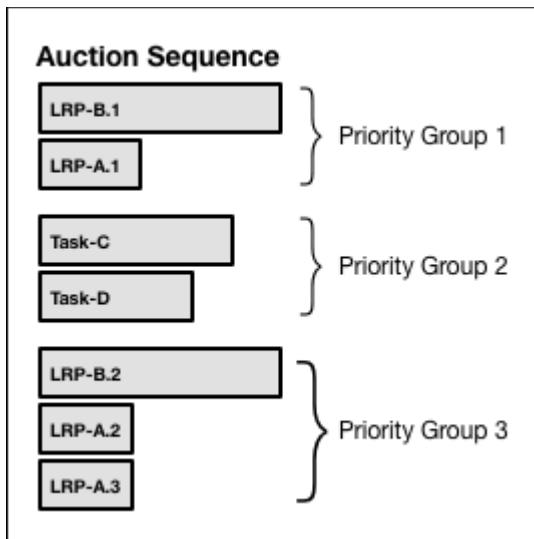
Process	Desired Instances	Load	Jobs
LRP-A	3	2	
LRP-B	2	5	

The Auctioneer then builds an ordered sequence of LRP instances by cycling through the list of LRPs in decreasing order of load. With each cycle, it adds another instance of each LRP to the sequence, until all desired instances of the LRP have been added. With the example above, the Auctioneer would order the LRPs like this:



The Auctioneer then builds an ordered sequence for all jobs, both LRPs and Tasks. Reflecting the auction batch priority order, the first instances of LRPs are first priority. Tasks are next, in decreasing order of load. Duplicate LRP jobs come last.

Adding one-time Task-C (load = 4) and Task-D (load = 3) to the above example, the priority order becomes:



The previous diagram shows the following content:

- Title: Auction Sequence
  - Priority Group 1
    - LRP-B.1 (wide box)
    - LRP-A.1 (narrow box)
  - Priority Group 2
    - Task-C (medium-wide box)
    - Task-D (narrower box)
  - Priority Group 3
    - LRP-B.2 (wide box)
    - LRP-A.2 (narrow box)
    - LRP-A.3 (narrow box)

## Auctioning the batch to the Diego Cells

With all jobs sorted in priority order, the Auctioneer allocates each in turn to one of the VMs. The process resembles an auction, where VMs “bid” with their suitability to run each job. Facilitating this process, each app VM has a resident Diego Cell that monitors and allocates the machine’s operation. The Diego Cell participates in the auction on behalf of the virtual machine that it runs on. For more information, see the [Diego Components](#) section of the *Diego Components and Architecture* topic.

Starting with the highest priority job in the ordered sequence, the Auctioneer polls all the Diego Cells on their fitness to run the currently-auctioned job.

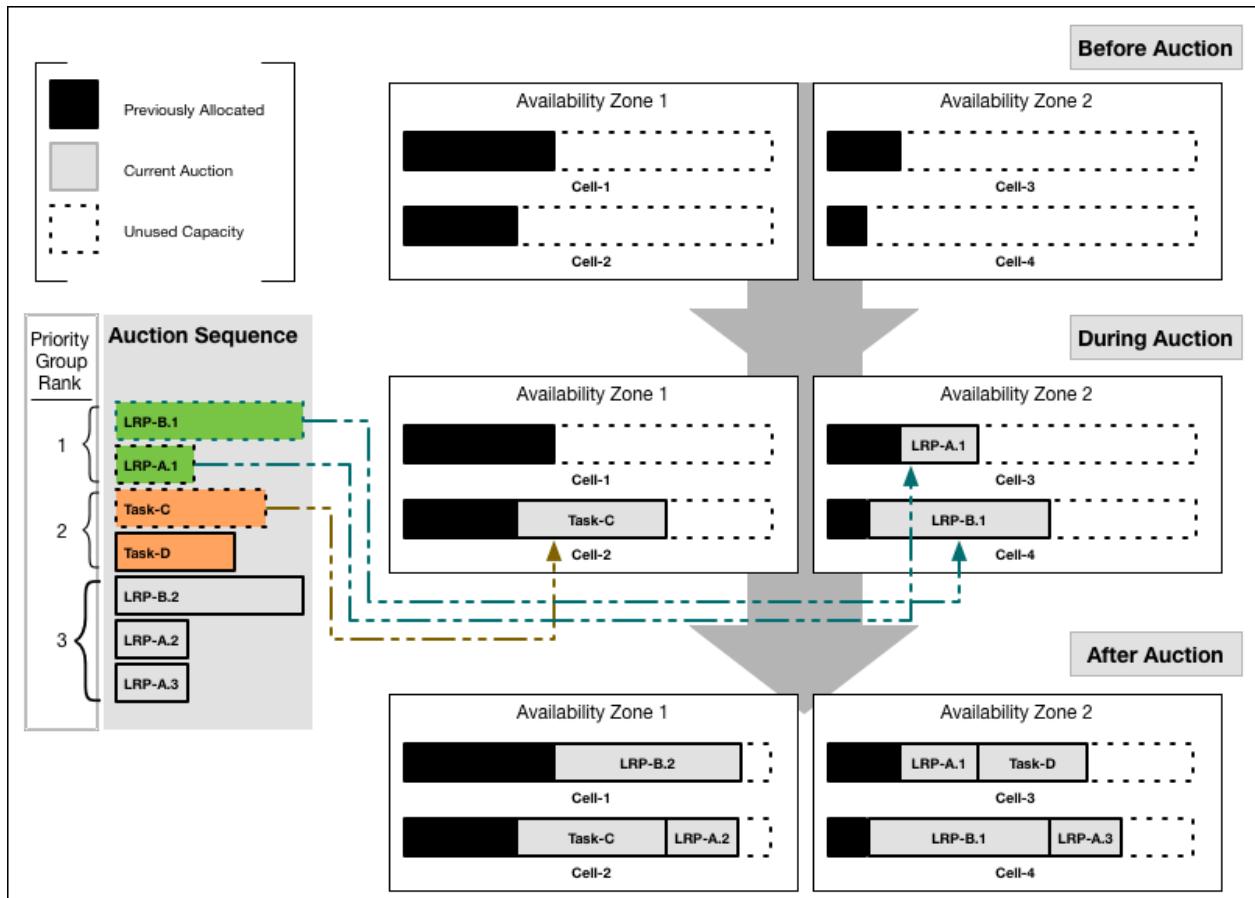
Diego Cells “bid” to host each job according to the following priorities, in decreasing order:

1. Allocate all jobs only to Diego Cells that have the correct software stack to host them, and sufficient resources given their allocation so far during this auction.
2. Allocate LRP instances into Availability Zones that are not already hosting other instances of the same LRP.

3. Within each Availability Zone, allocate LRP instances to run on Diego Cells that are not already hosting other instances of the same LRP.
4. Allocate any job to the Diego Cell that has lightest load, from both the current auction and jobs it has been running already. In other words, distribute the total load evenly across all Diego Cells.

This example auction sequence has seven jobs: five LRP instances and two Tasks.

The following diagram shows how the Auctioneer might distribute this work across four Diego Cells running in two Availability Zones:



If the Auctioneer reaches the end of its sequence of jobs, having distributed all jobs to the Diego Cells, it submits requests to the Diego Cells to run their allotted work. If the Diego Cells run out of capacity to handle all jobs in the sequence, the Auctioneer carries the unallocated jobs over and merges them into the next auction batch, to be allocated in the next auction.

## Triggering another auction

The Diego Auction process repeats to adapt a TAS for VMs deployment to its changing workload. For example, the BBS initiates a new auction when it detects that the actual number of running instances of LRPs does not match the number desired. Diego's BBS component monitors the number of instances of each LRP that are currently running. The BBS component periodically compares this number with the desired number of LRP instances, as configured by the user. If the actual number falls short of what is desired, the BBS triggers a new auction. In the case of a surplus of app instances, the BBS stops the extra instances and initiates another auction.

Cloud Controller also starts an auction whenever a Diego Cell fails. After any auction, if a Diego Cell responds to its work request with a message that it cannot perform the work after all, the Auctioneer carries the unallocated work over into the next batch. But if the Diego Cell fails to respond entirely, for example if its connection times out, the unresponsive Diego Cell might still be running its' work. In this case, the Auctioneer does not automatically carry the Diego Cell's work over to the next batch. Instead, the Auctioneer defers to the BBS to continue monitoring the states of the Diego Cells, and to reassign unassigned work later if needed.

## High Availability in TAS for VMs

This topic tells you about the components used to ensure high availability in VMware Tanzu Application Service for VMs (TAS for VMs), vertical and horizontal scaling, and the infrastructure required to support scaling component VMs for high availability.

A system with high availability provides higher than typical uptime through redundancy of apps and component VMs. You can create the redundancy required for high availability in several ways, such as running VMs in multiple availability zones and using external blob storage solutions.

This topic provides you guidance on configuring your TAS for VMs deployment for high availability.

## Components of high availability deployments

You can use availability zones, external load balancers, and external blob storage to ensure high availability for your deployment.

### Availability zones

Availability Zones (AZs) are locations where public cloud services offer data centers.

You can assign and scale components in multiple AZs to help maintain high availability through redundancy. To configure sufficient redundancy, deploy TAS for VMs across three or more AZs and assign multiple component instances to different AZs.

Always use an odd number of AZs. This ensures that your deployment remains available as long as greater than half of the AZs are available.

For example, a deployment with three AZs stays available when one AZ is unavailable. A deployment with five AZs stays available when two AZs are unavailable.

### External load balancers

External load balancers distribute traffic coming from the internet to your internal network.

To ensure high availability for production environments, use a highly available customer provided external load balancing solution that does the following:

- Provides load balancing to each of the TAS for VMs router IP addresses.
- Supports SSL termination with wildcard DNS location.
- Adds appropriate `x-forwarded-for` and `x-forwarded-proto` HTTP headers to incoming requests.
- (Optional) Supports WebSockets.

For more information, see [Using your own load balancer](#).

## External blob storage

Blobs are large binary files, such as PDFs or images. To store blobs for high availability, use external storage such as Amazon S3 or an S3-compatible service.

You can also store blobs internally using WebDAV or NFS. These components run as single instances and you cannot scale them. For these deployments, use the high availability features of your IaaS to immediately recover your WebDAV or NFS server VM if it fails.

If you need assistance, contact [Support](#).

The singleton compilation components do not affect platform availability.

## Scaling platform capacity

You can scale platform capacity in the following ways:

- **Vertical scaling:** Add memory and disk to each VM.
- **Horizontal scaling:** Add more VMs that run instances of TAS for VMs components.

The type of apps you host on TAS for VMs determines whether you scale vertically or horizontally.

For more information about scaling apps and maintaining app uptime, see [Scaling an app using cf scale](#) and [Using Blue-Green Deployment to Reduce Downtime and Risk](#)

### Scaling vertically

Scaling vertically means adding memory and disk to your component VMs.

To scale vertically, allocate and maintain the following:

- Free space on host Diego Cell VMs so that apps expected to deploy can successfully be staged and run.
- Disk space and memory in your deployment so that if one host VM is down, all instances of apps can be placed on the remaining host VMs.
- Free space to handle one AZ going down if deploying in multiple AZs.

### Scaling horizontally

Scaling horizontally means increasing the number of instances of VMs that run a functional component of a system.

You can horizontally scale most TAS for VMs component VMs to multiple instances for high availability.

You must also distribute the instances of components across different AZs to minimize downtime during ongoing operation, product updates, and platform upgrades. For more information about using AZs, see [Availability Zones](#).

## Recommended instance counts for high availability

For more information regarding rolling app deployments, see [Scaling TAS for VMs](#).

The following table provides the instance counts that VMware recommends for a high-availability deployment and the minimum instances for a functional deployment:

VMware Tanzu Application Service for VMs Job	Recommended Instance Number for HA	Minimum Instance Number	Notes
Diego Cell	$\geq 3$	1	The optimal balance between CPU and memory sizing and instance count depends on the performance characteristics of the apps that run on Diego Cells. Scaling vertically with larger Diego Cells makes for larger points of failure, and more apps go down when a Diego Cell fails. On the other hand, scaling horizontally decreases the speed at which the system re-balances apps. Re-balancing 100 Diego Cells takes longer and demands more processing overhead than re-balancing 20 Diego Cells.
Diego Brain	$\geq 2$	1	For high availability, use at least one per AZ, or at least two if only one AZ.
Diego BBS	$\geq 2$	1	For high availability in a multi-AZ deployment, use at least one instance per AZ. Scale Diego BBS to at least two instances for high availability in a single-AZ deployment.
MySQL Server	3	1	If you use an external database in your deployment, you can set the MySQL Server instance count to 0. To scale down an internal MySQL cluster, see <a href="#">Scaling Down Your MySQL Cluster</a> in <a href="#">Scaling Internal MySQL</a> .
MySQL Proxy	2	1	If you use an external database in your deployment, then you can set the MySQL Proxy instance count to 0.
NATS	$\geq 2$	1	In a high-availability deployment, you might run a single NATS instance if your deployment lacks the resources to deploy two stable NATS servers. Components using NATS are resilient to message failures and the BOSH Resurrector recovers the NATS VM quickly if it becomes non-responsive.
Cloud Controller	$\geq 2$	1	Scale the Cloud Controller to accommodate the number of requests to the API and the number of apps in the system.
Clock Global	$\geq 2$	1	For a high-availability deployment, scale the Clock Global job to a value greater than 1 or to the number of AZs you have.
Router	$\geq 2$	1	Scale the Gorouter to accommodate the number of incoming requests. Additional instances increase available bandwidth. In general, this load is much less than the load on Diego Cells.
UAA	$\geq 2$	1	
Doppler Server	$\geq 2$	1	Deploying additional Doppler servers splits traffic across them. For a high-availability deployment, VMware recommends at least two per AZ.

VMware Tanzu Application Service for VMs Job	Recommended Instance Number for HA	Minimum Instance Number	Notes
Loggregator TrafficController	≥ 2	1	Deploying additional Loggregator TrafficController instances allows you to direct traffic to them in a round-robin manner. For a high-availability deployment, VMware recommends at least two per AZ.
Log Cache	≥ 3	1	Deploying additional Log Cache instances increases the total storage, sharding data by app ID. If app logs and metrics are sharded to an unavailable instance, they are unavailable when the designated instance is unavailable regardless of the number of instances or AZs. Data is not re-balanced unless you increase or decrease the number of desired instances in Operations Manager and apply changes.
CredHub	≥ 3	2	CredHub is a scalable component. For high availability, use at least one instance per AZ, or at least three instances if only one AZ is present.

## Infrastructure for component scaling

The ability to scale component VMs is important for high availability. To scale component VMs, you must make sure that the surrounding infrastructure of your deployment supports VM scaling.

Learn about the infrastructure required to support scaling component VMs for high availability.

## BOSH Resurrector

The BOSH Resurrector increases VMware Tanzu Application Service for VMs (TAS for VMs) availability in the following ways:

- Reacts to hardware failure and network disruptions by recreating VMs on active, stable hosts
- Detects operating system failures by continuously monitoring VMs and recreating them as required
- Continuously monitors the BOSH Agent running on each VM and recreates the VMs as required

The BOSH Resurrector continuously monitors the status of all VMs in a TAS for VMs deployment. The Resurrector also monitors the BOSH Agent on each VM. If either the VM or the BOSH Agent fail, the Resurrector recreates the VM on another active host. To enable the BOSH Resurrector, see the [Enable BOSH Resurrector](#) section of the *Using the BOSH Resurrector* topic.

## Resource pools

Each IaaS has different ways of limiting resource consumption for scaling VMs. Consult with your IaaS administrator to ensure additional VMs and related resources, like IPs and storage, are available to scale.

For more information about configuring your resource pools according to the requirements of your deployment, see the [Tanzu Operations Manager configuration topic for your IaaS](#).

For information about configuring resource pools for Amazon Web Services, see [Amazon EC2 FAQs](#) in the Amazon documentation.

For information about configuring resource pools for OpenStack, see [Manage projects and users](#) in the OpenStack documentation.

For information about configuring resource pools for vSphere, see the [Resource Config Pane](#) section of the *Configuring BOSH Director on vSphere* topic.

## Databases

For database services deployed outside TAS for VMs, use the high availability features included with your infrastructure. Also, configure backup and restore where possible. For more information about scaling internal database components, see [Scaling TAS for VMs](#).

Data services might have single points of failure depending on their configuration.

If you need assistance, contact [Support](#).

## How TAS for VMs Maintains High Availability

VMware Tanzu Application Service for VMs (TAS for VMs) deployments make up several layers of high availability to keep your apps running during system failure. These layers include AZs, app health management, process monitoring, and VM resurrection.

## Availability zones

Operations Manager supports deploying apps instances across multiple AZs. This level of high availability requires that you define AZs in your IaaS. Operations Manager balances the apps you deploy across the AZs you defined. If an AZ goes down, you still have app instances running in another.

You can configure your deployment so that Diego Cells are created across these AZs in the **Assign AZs and Networks** pane of the TAS for VMs tile.

## Health management for app instances

If you lose app instances for any reason, such as a bug in the app or an AZ going down, Operations Manager restarts new instances to maintain capacity. Under Diego architecture, the nsync, BBS, and Cell Rep components track the number of instances of each app that are running across all of the Diego cells. When these components detect a discrepancy between the actual state of the app instances in the cloud and the desired state as known by the Cloud Controller, they advise the Cloud Controller of the difference and the Cloud Controller initiates the deployment of new app instances.

For more information about the nsync, BBS, and Cell Rep components, see the [nsync, BBS, and Cell Rep](#) section of the *TAS for VMs Components* topic.

## Process monitoring

Operations Manager uses a BOSH agent, monit, to monitor the processes on the component VMs that work together to keep your apps running, such as nsync, BBS, and Cell Rep. If monit detects a failure, it restarts the process and notifies the BOSH agent on the VM. The BOSH agent notifies the BOSH Health Monitor, which starts the responders through plug-ins. For example, email notifications or paging.

## Resurrector VMs

BOSH detects if a VM is present by listening for heartbeat messages that are sent from the BOSH agent every 60 seconds. The BOSH Health Monitor listens for those heartbeats. When the Health Monitor finds that a VM is not responding, it passes an alert to the Resurrector component. If the Resurrector is enabled, it sends the IaaS a request to create a new VM instance to replace the one that failed.

To enable the Resurrector, see the following pages for your particular IaaS: [AWS](#), [Azure](#), [GCP](#), [OpenStack](#), or [vSphere](#).

## TAS for VMs Security

This topic provides you with an overview of VMware Tanzu Application Service for VMs (TAS for VMs) security. For an overview of container security, see [Container Security](#).

TAS for VMs implements the following measures to mitigate against security threats:

- Minimizes network surface area.
- Isolates customer apps and data in containers.
- Encrypts connections.
- Uses role-based access controls, applying and enforcing roles and permissions to ensure that users can only view and affect the spaces for which they have been granted access.
- Ensures security of app bits in a multi-tenant environment.
- Prevents possible denial of service attacks through resource starvation.

## System boundaries and access

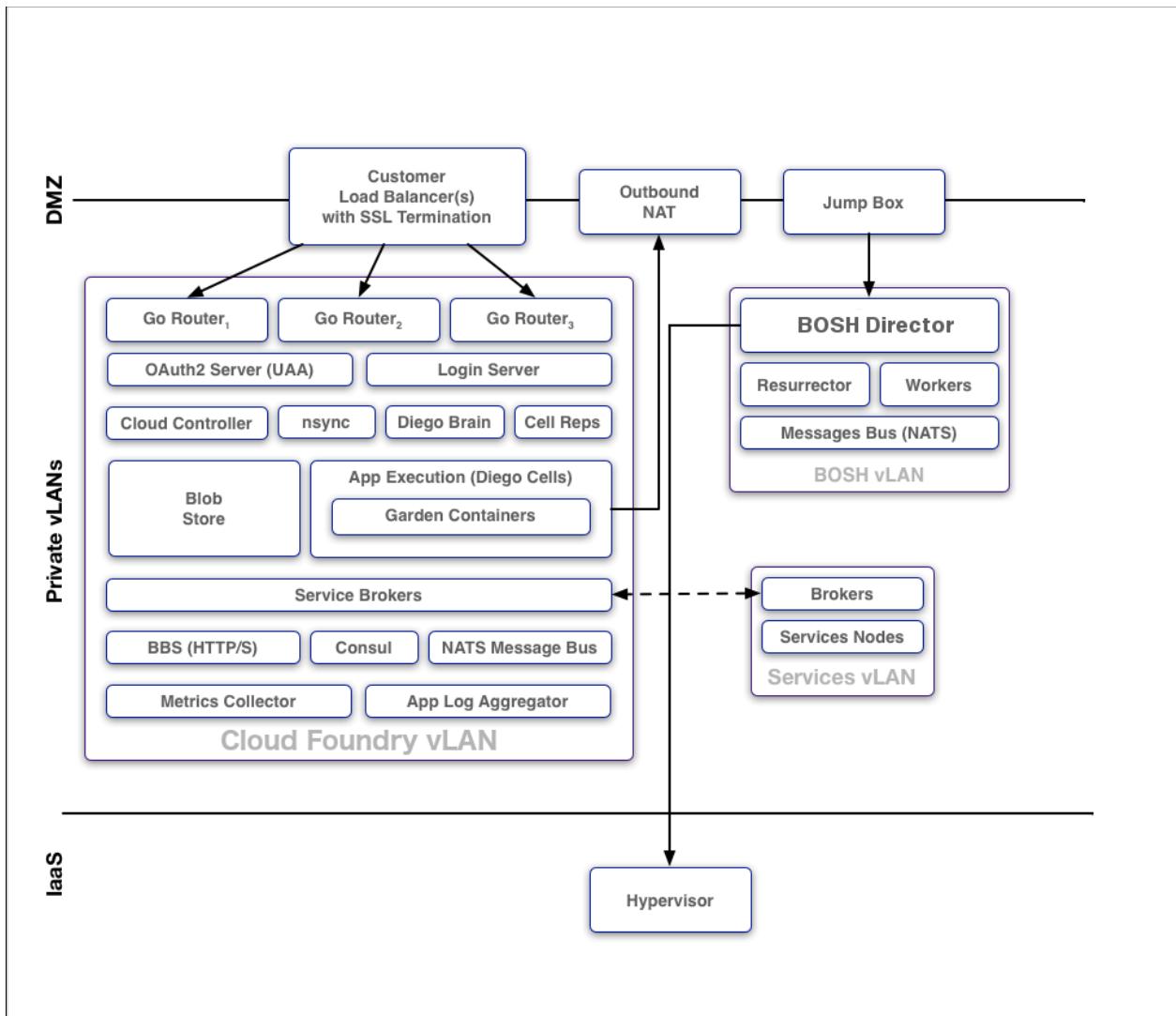
In a typical deployment of TAS for VMs, the components run on virtual machines (VMs) that exist within a VLAN.

In this configuration, the only access points visible on a public network are a load balancer that maps to one or more TAS for VMs routers and, optionally, a NAT VM and a jumpbox. Because of the limited number of contact points with the public internet, the surface area for possible security vulnerabilities is minimized.

As the following diagram shows the architecture of a typical deployment of TAS for VMs:



VMware recommends that you also install a NAT VM for outbound requests and a jumpbox to access the BOSH Director, though these access points are optional depending on your network configuration.



The diagram shows the following components:

- DMZ
  - Customer Load Balancers with SSL Termination
  - Outbound NAT
  - Jumpbox
- Private vLANs
  - Cloud Foundry vLAN
    - Three Go Routers
    - OAuth2 Server (UAA)
    - Login Server
    - Cloud Controller
    - nsync
    - Diego Brain
    - Cell Reps
    - Blob Store
  - BOSH vLAN
    - BOSH Director
    - Resurrector
    - Workers
    - Messages Bus (NATS)

- App Execution (Diego Cells) with Garden Containers
- Service Brokers
- BBS (HTTP/S)
- Consul
- NATS Message Bus
- Metrics Collector
- App Log Aggregator
- BOSH vLAN
  - BOSH Director
  - Resurrector
  - Workers -Message Bus (NATS)
- Services vLAN
  - Brokers
  - Services Nodes
- IaaS
  - Hypervisor

The preceding diagram shows the following communications:

- Customer Load Balancers send communication to the three Go Routers.
- Outbound NAT communicates with Hypervisor.
- BOSH Director communicates with the App Execution (Diego Cells).
- Service Brokers in Cloud Foundry vLAN communicates with Brokers in Services vLAN.

## Protocols

All traffic from the public internet to the Cloud Controller and UAA happens over HTTPS. Inside the boundary of the system, components communicate over a publish-subscribe (pub-sub) message bus NATS, HTTP, and SSL/TLS.

## BOSH

Operators deploy TAS for VMs with BOSH. The BOSH Director is the core orchestrating component in BOSH: it controls VM creation and deployment, as well as other software and service lifecycle events. You use HTTPS to ensure secure communication to the BOSH Director.

VMware recommends that you deploy the BOSH Director on a subnet that is not publicly accessible, and access the BOSH Director from a jumpbox on the subnet or through VPN.

BOSH includes the following capability for security:

- Communicates with the VMs it runs through NATS. Because NATS cannot be accessed from outside TAS for VMs, this ensures that published messages can only originate from a component within your deployment.

- Provides an audit trail through the `bosh tasks --all` and `bosh tasks --recent=VALUE` commands. `bosh tasks --all` returns a table that shows all BOSH actions taken by an operator or other running processes. `bosh tasks --recent=VALUE` returns a table of recent tasks, with `VALUE` being the number of recent tasks you want to view.
- Allows you to set up individual login accounts for each operator. BOSH operators have root access.



BOSH does not encrypt data stored on BOSH VMs. Your IaaS might encrypt this data.

## Isolation segments

Isolation segments provide dedicated pools of resources to which apps can be deployed to isolate workloads. Using isolation segments separates app resources as completely as if they were in different TAS for VMs deployments but avoids redundant management components and unneeded network complexity.

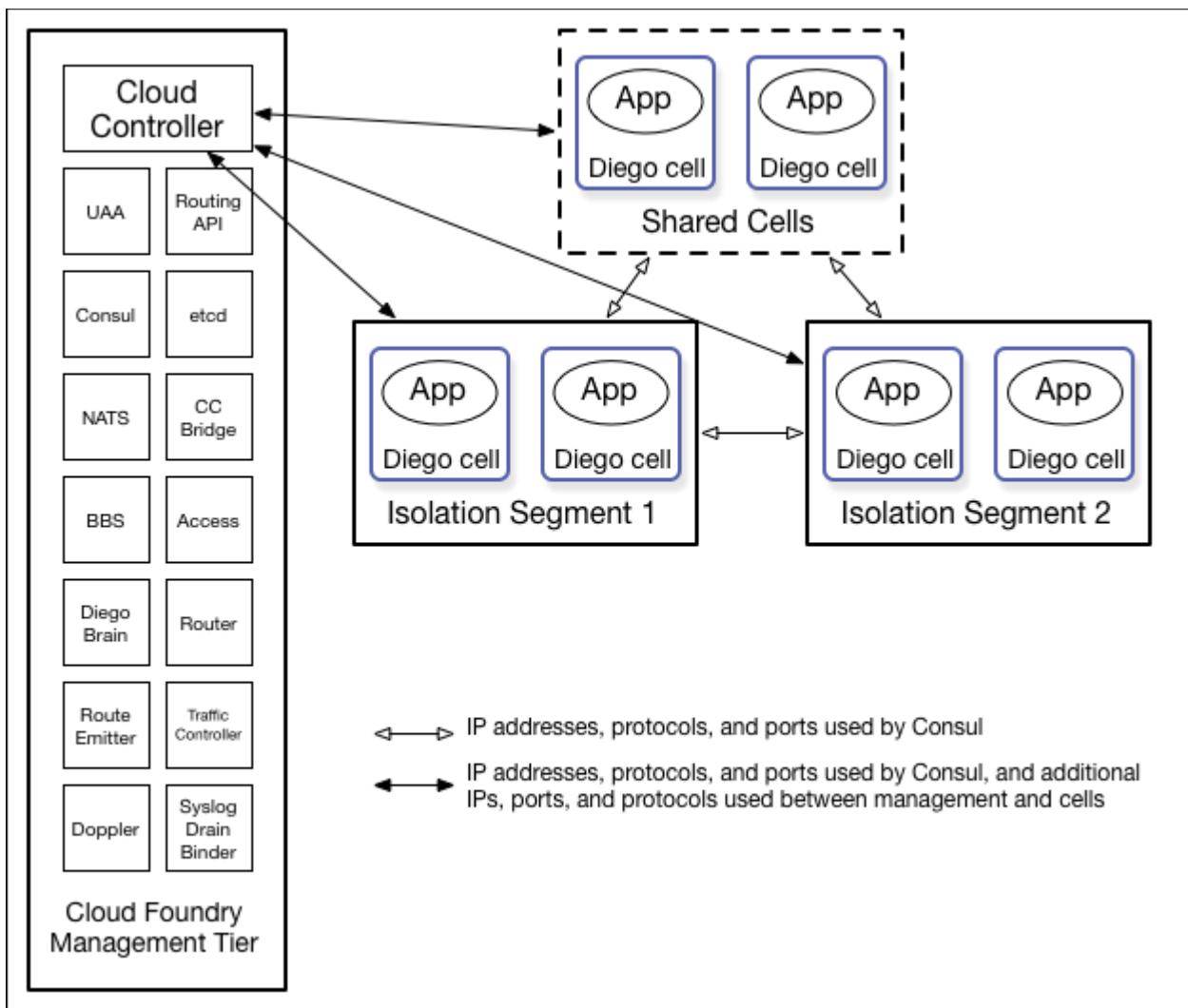
You can designate isolation segments for exclusive use by orgs and spaces within TAS for VMs. This guarantees that apps within the org or space use resources that are not also used by other orgs or spaces. For more information, see [Orgs, Spaces, Roles, and Permissions](#).

Customers can use isolation segments for different reasons, including:

- To follow regulatory restrictions that require separation between different types of apps. For example, a health care company might not be able to host medical records and billing systems on the same machines.
- To dedicate specific hardware to different isolation segments. For example, to ensure that high-priority apps run on a cluster of high-performance hosts.
- To separate data on multiple clients, to strengthen a security story, or offer different hosting tiers.

In TAS for VMs, the Cloud Controller database (CCDB) identifies isolation segments by name and GUID, for example `30dd879c-ee2f-11db-8314-0800200c9a66`. The isolation segment object has no internal structure beyond these two properties at the TAS for VMs level, but BOSH associates the name of the isolation segment with Diego Cells, through their `placement_tag` property.

This diagram shows how isolation segments keep apps running on different pools of Diego Cells, and how the Diego Cells communicate with each other and with the management components:



For more information about how to create and manage isolation segments in an Tanzu Operations Manager deployment, see [Installing Isolation Segment](#) and [Managing Isolation Segments](#).

For API commands related to isolation segments, see [Isolation Segments](#) in the Cloud Controller API (CAPI) Reference.

## Authentication and authorization

User Account and Authentication (UAA) is the central identity management service for TAS for VMs and its various components.

UAA acts as an OAuth2 Authorization Server and issues access tokens for apps that request platform resources. The tokens are based on the [JSON Web Token](#) and are digitally signed by UAA.

Operators can configure the identity store in UAA. If users register an account with the TAS for VMs platform, UAA acts as the user store and stores user passwords in the UAA database using [bcrypt](#). UAA also supports connecting to external user stores through LDAP and SAML. Once an operator has configured the external user store, such as a corporate Microsoft Active Directory, users can use their LDAP credentials to gain access to the TAS for VMs platform instead of registering a separate account. Alternatively, operators can use SAML to connect to an external user store and enable single sign-on for users into the TAS for VMs platform.

Standard TAS for VMs deployments based on [cf-deployment](#) provide a UAA client `cf` that can be used to create OAuth 2 tokens using the Password Grant Flow for TAS for VMs users that are needed to access the CF API. This UAA client is also used by the CF CLI. The UAA client `cf` doesn't require a `client_secret`.

## Managing user access with Role-Based Access Control

Apps that users deploy to TAS for VMs exist within a space. Spaces exist within orgs. To view and access an org or a space, a user must be a member of it. TAS for VMs uses role-based access control (RBAC), with each role granted permissions to either an org or a specified space. For more information about roles and permissions, see [Orgs, Spaces, Roles, and Permissions](#).

For more information, see [Getting started with Apps Manager](#) and [Managing User Roles using Apps Manager](#).

## Security for service broker integration

The Cloud Controller authenticates every request with the Service Broker API using HTTP or HTTPS, depending on which protocol that you specify during broker registration. The Cloud Controller rejects any broker registration that does not contain a username and password.

Service instances bound to an app contain credential data. Users specify the binding credentials for user-provided service instances, while third-party brokers specify the binding credentials for managed service instances. The VCAP\_SERVICES environment variable contains credential information for any service bound to an app. TAS for VMs constructs this value from encrypted data that it stores in the CCDB. For more information about user-provided service instances, see [User-Provided Service Instances](#).

The selected third-party broker controls how securely to communicate managed service credentials.

A third-party broker might offer a dashboard client in its catalog. Dashboard clients require a text string defined as a `client_secret`. TAS for VMs does not store this secret in the CCDB. Instead, TAS for VMs passes the secret to the UAA component for verification using HTTP or HTTPS.

## Managing software vulnerabilities

TAS for VMs manages software vulnerability using releases and BOSH stemcells. New TAS for VMs releases are created with updates to address code issues, while new stemcells are created with patches for the latest security fixes to address any underlying operating system issues.

## Ensuring security for app artifacts

TAS for VMs secures both the code and the configuration of an app using the following functions:

- App developers push their code using the TAS for VMs API. TAS for VMs secures each call to the TAS for VMs API using the [UAA](#) and SSL.
- The Cloud Controller uses [RBAC](#) to ensure that only authorized users can access a particular app.
- The Cloud Controller stores the configuration for an app in an encrypted database table. This configuration data includes user-specified environment variables and service credentials for any services bound to the app.

- TAS for VMs runs the app inside a secure container. For more information, see [Container Security](#).
- TAS for VMs operators can configure network traffic rules to control inbound communication to and outbound communication from an app. For more information, see the [Network Traffic Rules](#) section of the *Container Security* topic.

## Security event logging and auditing

For operators, TAS for VMs provides an audit trail through the `bosh tasks` command. This command shows all actions that an operator has taken with the platform. Additionally, operators can redirect TAS for VMs component logs to a standard syslog server using the `syslog_daemon_config` property in the `metron_agent` job of `cf-release`.

For users, TAS for VMs records an audit trail of all relevant API invocations of an app. The Cloud Foundry Command Line Interface (cf CLI) command `cf events` returns this information.

## Recommendations for running a secure deployment

To help run a secure deployment, VMware recommends:

- Configure UAA clients and users using a BOSH manifest. Limit and manage these clients and users as you would any other kind of privileged account.
- Deploy within a VLAN that limits network traffic to individual VMs. This reduces the possibility of unauthorized access to the VMs within your BOSH-managed cloud.
- Enable HTTPS for apps and SSL database connections to protect sensitive data transmitted to and from apps.
- Ensure that the jumpbox is secure, along with the load balancer and NAT VM.
- Encrypt stored files and data within databases to meet your data security requirements. Deploy using industry standard encryption and the best practices for your language or framework.
- Prohibit promiscuous network interfaces on the trusted network.
- Review and monitor data sharing and security practices with third party services that you use to provide additional function to your app.
- Store SSH keys securely to prevent disclosure, and promptly replace lost or compromised keys.
- Use TAS for VMs's RBAC model to restrict your users' access to only what is necessary to complete their tasks.
- Use a strong passphrase for both your TAS for VMs user account and SSH keys.

Use the [IPsec for VMware Tanzu](#) to encrypt IP data traffic within your deployment.

## Compliance

For information about compliance in TAS for VMs, see the following topics:

- [NIST Controls and VMware Tanzu Application Service for VMs](#): Provides a dedicated site that assesses TAS for VMs against NIST SP 800-53(r4) Controls.

- [General Data Protection Regulation](#): Provides an overview of the General Data Protection Regulation (GDPR) and where TAS for VMs might store personal data.

## Security for apps and services

This section links to topics that describe how TAS for VMs and TAS for VMs users manage security for apps and service instances.

- [App Security Groups](#): Describes how App Security Groups (ASGs) work and how to manage them in TAS for VMs.
- [Configuring SSH Access for TAS for VMs](#): Explains how to configure TAS for VMs to allow SSH access to app instances for debugging.
- [Restricting App Access to Internal TAS for VMs Components](#): Details how to create ASGs, rules that allow internal outgoing communications from all apps in TAS for VMs, or the apps running in the same space.
- [Configuring App Security Groups for Email Notifications](#): Describes how to define an ASG to enable app-generated notifications.
- [Trusted System Certificates](#): Explains where apps can find trusted system certificates.
- [Managing Access to Service Plans](#): Describes how to activate or deactivate access to service plans for a subset of users.
- [Delivering Service Credentials to an App](#): Describes how to bind apps to service instances, which generate the credentials that enable the apps to use the service.
- [Managing Service Keys](#): Explains how to create and manage service keys that allow apps to use service instances.

## General Data Protection Regulation and TAS for VMs

Learn about the General Data Protection Regulation (GDPR) and where VMware Tanzu Application Service for VMs (TAS for VMs) might store personal data.

GDPR came into effect on May 25, 2018 and affects any company processing the data of EU citizens or residents, even if the company is not EU-based. The GDPR sets forth how companies can handle privacy issues, securely store data, and respond to security breaches.

## Process personal data

The GDPR grants data subjects certain rights, such as the right to obtain a copy of their personal data, object to the processing of personal data, and the right to have their personal data erased. Organizations subject to GDPR need to ensure that they can address and respond to requests by data subjects if they are processing their personal data.

Article 4, Section 1 of the GDPR defines personal data as follows:

*'personal data' is any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more*

*factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person;*

For more information, see the [GDPR text](#).

Personal data can be collected, stored, and processed in a TAS for VMs deployment. VMware has performed a review of TAS for VMs components and determined that personal data might reside in the areas discussed in the following sections.

## Where personal data might reside

The following sections explain how different TAS for VMs components collect personal data.

### User Account and Authentication (UAA)

UAA is an open-source Cloud Foundry component that provides identity management features and identity-based security for apps and APIs. For more information, see [User Account and Authentication](#).

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?
<b>Business Initiation</b>	User registers	<ul style="list-style-type: none"> <li>• Username</li> <li>• Email address</li> <li>• First name (optional )</li> <li>• Last name (optional )</li> <li>• User ID (UAA GUID, generate d)</li> </ul>	User registration submission	UAA DB	Stored in UAA DB	<ul style="list-style-type: none"> <li>• End user</li> <li>• UAA administrators</li> </ul>

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?
	Just-in-time provisioning: create user on user login	<ul style="list-style-type: none"> <li>• Username</li> <li>• Email address</li> <li>• First name (optional)</li> <li>• Last name (optional)</li> <li>• User ID (UAA GUID, generated)</li> <li>• Additional attributes as defined by the organization</li> </ul>	User login	UAA DB	Stored in UAA DB	UAA administrators

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?
	Admin user makes a creation API call	<ul style="list-style-type: none"> <li>• Username</li> <li>• Email address</li> <li>• First name (optional)</li> <li>• Last name (optional)</li> <li>• User ID (UAA GUID, generated)</li> <li>• Additional attributes as defined by the organization</li> </ul>	Admin API call	UAA DB	Stored in UAA DB	UAA administrators
<b>Business Execution</b>	User self-updates profile	<ul style="list-style-type: none"> <li>• Email address</li> <li>• First name (optional)</li> <li>• Last name (optional)</li> </ul>	User registration submission	UAA DB	Stored in UAA DB	<ul style="list-style-type: none"> <li>• End user</li> <li>• UAA administrators</li> </ul>

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?
	Just-in-time provisioning: user update	<ul style="list-style-type: none"> <li>Email address</li> <li>First name (optional)</li> <li>Last Name (optional)</li> <li>Additional attributes as defined by the organization</li> </ul>	User login	UAA DB	Stored in UAA DB	UAA administrators
	User logs in	<ul style="list-style-type: none"> <li>Current account cookie (generated)</li> <li>Saved account cookie (generated)</li> </ul>	User login	User browser	By UAA	<ul style="list-style-type: none"> <li>End user</li> <li>UAA login page</li> </ul>
	Admin user makes an update API call	<ul style="list-style-type: none"> <li>Email address</li> <li>First name (optional)</li> <li>Last name (optional)</li> <li>Additional attributes as defined by the organization</li> </ul>	Admin API call	UAA DB	Stored in UAA DB	UAA administrators

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?
<b>Delete User Flow</b>	Admin user makes a hard delete API call	n/a	n/a	n/a	Deleted from UAA DB	UAA administrators
	Admin user makes a deactivation API call	n/a	n/a	Soft delete (records still held in database but user cannot login)	UAA administrators	
<b>Reports/Logs</b>	Event or debug logs	Any information	When event happens	UAA logs	Depends on setup of <a href="#">Loggregator</a> and log forwarding	BOSH administrators

## Cloud Foundry API

The Cloud Foundry API release contains several components, including the Cloud Controller. For more information, see the Cloud Foundry API release [README](#).

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How long is it kept?
<b>Business initiation</b>	User makes a request for the first time	User ID	The first time a user makes a request to the API	Cloud Controller database	It is used to identify permissions for the user	Operations Manager operator	As long as the user is part of the system

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How long is it kept?
<b>Business execution</b>	Troubleshooting API requests	<ul style="list-style-type: none"> <li>User ID</li> <li>User agent</li> <li>IP address</li> </ul>	On each request	<ul style="list-style-type: none"> <li>Local VM: com ponent and logs</li> <li>Log aggregator used by Operator ns Manager operator</li> </ul>	n/a	Operations Manager operator	<ul style="list-style-type: none"> <li>Local VM: 4 week maxium by default</li> <li>Log aggregator configuration is defined by Operator Manager operator</li> </ul>

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How long is it kept?
Audit trails	Audit what changes a user makes	<ul style="list-style-type: none"> <li>Name</li> <li>User ID</li> <li>Email address</li> </ul>	On specific API requests that mutate the state of resources	Audit Event table in the Cloud Controller DB	n/a	<ul style="list-style-type: none"> <li>Operators</li> <li>Managers</li> <li>operators</li> <li>You can view the resource that had an audit ed change</li> </ul>	31 days

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How long is it kept?
	Audit what changes a user makes	<ul style="list-style-type: none"> <li>IP Address</li> <li>Email address</li> <li>User ID</li> <li>User name</li> </ul>	<ul style="list-style-type: none"> <li>On each request</li> </ul>	<ul style="list-style-type: none"> <li>Local VM: CEF logs</li> <li>Log aggregator or used</li> <li>by Operator</li> <li>Manager operator</li> </ul>	n/a	Operations Manager operator	<ul style="list-style-type: none"> <li>Local VM: 4 week maximum by default</li> <li>Log aggregator operator configuration by Operator Manager operator</li> </ul>
	Audit what user created a resource	<ul style="list-style-type: none"> <li>Name</li> <li>User ID</li> <li>Email address</li> </ul>	<ul style="list-style-type: none"> <li>When API resources are created</li> </ul>	As part of the resource row in Cloud Controller DB	n/a	<ul style="list-style-type: none"> <li>Operator</li> <li>Manager operator</li> <li>Users that can view the resource</li> </ul>	As long as the resource exists
Business Initiative	User makes a request for the first time	User ID	The first time a user makes a request to the API	Cloud Controller DB	It is used to identify permissions for the user	Operations Manager operator	As long as the user is part of the system

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How long is it kept?
<b>Business</b> <b>Execution</b>	Troubleshooting API requests	<ul style="list-style-type: none"> <li>User ID</li> <li>User agent</li> <li>IP addresses</li> </ul>	<ul style="list-style-type: none"> <li>On each request</li> </ul>	<ul style="list-style-type: none"> <li>Local VM: com ponent and logs</li> <li>Log aggregator used by Operator Manager operator</li> </ul>	n/a	<ul style="list-style-type: none"> <li>Operations Manager operator</li> <li>Log aggregator or configuration by Operator Manager operator</li> <li>Manager operator</li> </ul>	<ul style="list-style-type: none"> <li>Local VM: 4 week maximum by default</li> <li>Log aggregator or as configured by Operator Manager operator</li> <li>Manager operator</li> </ul>
<b>Audit Trails</b>	Audit what changes a user makes	<ul style="list-style-type: none"> <li>Name</li> <li>User ID</li> <li>Email addresses</li> </ul>	<ul style="list-style-type: none"> <li>On specific API requests that mutate the state of resources</li> </ul>	<ul style="list-style-type: none"> <li>Audit Event Table in the Cloud Controller DB</li> </ul>	n/a	<ul style="list-style-type: none"> <li>Operators</li> <li>Managers</li> <li>Operator</li> <li>Users that can view the resource that had an audit ed change</li> </ul>	31 days

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How long is it kept?
	Audit what changes a user makes	<ul style="list-style-type: none"> <li>IP address</li> <li>Email address</li> <li>User ID</li> <li>User name</li> </ul>	<ul style="list-style-type: none"> <li>On each request</li> </ul>	<ul style="list-style-type: none"> <li>Local VM: CEF logs</li> <li>Log aggregator or used by Open ratio ns</li> <li>Manager operator</li> <li>Administrator</li> </ul>	n/a	<ul style="list-style-type: none"> <li>Operations Manager operator</li> </ul>	<ul style="list-style-type: none"> <li>Local VM: 4 week maximum by default</li> <li>Log aggregator</li> <li>or as configured by default</li> <li>Operations Manager operator</li> </ul>
	Audit what user created a resource	<ul style="list-style-type: none"> <li>Name</li> <li>User ID</li> <li>Email address</li> </ul>	<ul style="list-style-type: none"> <li>When API resources are created</li> </ul>	<ul style="list-style-type: none"> <li>As part of the resource row in Cloud Controller DB</li> </ul>	n/a	<ul style="list-style-type: none"> <li>Operations Manager operator</li> </ul>	<ul style="list-style-type: none"> <li>As long as the resource exists</li> </ul>
						<ul style="list-style-type: none"> <li>Users that can view the resource</li> </ul>	

## Routing

By default, the Gorouter logs include the `X-Forwarded-For` header, which might include the originating client IP. Under GDPR, client IP addresses can be considered personal data.

### Deactivate client IP logging

In TAS for VMs v2.0 and later and Elastic Runtime v1.12, you can deactivate logging of client IP addresses in the Gorouter.

To deactivate logging of client IP addresses:

1. Go to the Tanzu Operations Manager Installation Dashboard and click the **TAS for VMs or Elastic Runtime** tile.
2. Click **Networking**.
3. In **Client IP Logging**::
  - If the source IP address exposed by your load balancer is its own IP address, select **Do not log X-Forwarded-For header**.
  - If the source IP address exposed by your load balancer belongs to the downstream client, select **Do not log source IP or X-Forwarded-For header**.
4. Click **Save**.
5. Return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes** to redeploy.

## Diego

Diego is the container management system for TAS for VMs. For more information, see [Diego Components and Architecture](#).

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How can I delete it?
<b>Business Execution</b>	Executing apps and tasks	No personal data is collected explicitly, but personal data might be encoded in app file contents or runtime metadata such as Diego environment variables or start commands.	Runtime metadata is collected when Cloud Controller submits work specification to the Diego BBS API. File contents are collected when Diego schedules an app or a task on a Diego Cell.	Runtime metadata is stored in the Diego BBS DB. App file contents are cached on Diego Cells.	Runtime metadata is used to start processes inside app instance containers and to configure their environment. App file contents are presented as part of the app instance container filesystem.	Platform operators and other developers with access to the Cloud Controller space containing that app can view the data.	<ul style="list-style-type: none"> <li>To delete the runtime metadata stored in the Diego BBS DB, stop the app or cancel the task that includes that data.</li> <li>To delete the app file contents stored in the running app and task containers, stop the app or cancel the task to destroy the containers. To get rid of the app file contents stored in the download</li> </ul>

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How can I delete it?
							cache on the Diego Cells, recreate the Diego Cell VMs.

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?	How can I delete it?
Reports/Logs	SSH proxy logs TAS for VMs user access.	UAA user name and ID	When the user authenticates for SSH access to an app.	The data is stored in a log file collocated with the SSH proxy instance handling the authentication request. This log file can also have its contents forwarded to a remote syslog destination.	No processing of the local log file is done automatically. If the log file contents are forwarded to a log aggregation service, they might be parsed and processed arbitrarily.	Only platform operators have access to the local log file. Platform operators or auditors have access to these log contents in a downstream log aggregation service.	<p>To delete the log lines containing the user ID:</p> <ol style="list-style-type: none"> <li>1. Run <code>bosh recreate</code> on the VMs hosting the SSH proxy processes to remove all the logs on ephemeral disk.</li> <li>2. <code>bosh ssh</code> into the VMs hosting the SSH proxy processes and remove specific log lines containing user IDs.</li> <li>3. Scrub corresponding log lines from any log aggregation service.</li> </ol>

## Notifications Service

The Notifications Service allows you to configure components of TAS for VMs to send emails to end users. For more information, see [Getting Started with the Notifications Service](#).

GDPR	Workflow	What personal data is collected?	When is it collected?	Where is it stored?	How is it processed?	Who has access to it?
<b>Business Executive</b>	Sending email to UAA users	User ID	First email sent	The <code>receipts</code> table in the Notifications database	Stored in the Notifications database	Notifications operator making a database query
	UAA user unsubscribes globally	User ID	When the UAA user unsubscribes	The <code>global_unsubscribes</code> table in the Notifications database	Stored in the Notifications database	Notifications operator making a database query
	UAA user unsubscribes from a specific kind of email	User ID	When the UAA user unsubscribes	The <code>unsubscribes</code> table in the Notifications database	Stored in the Notifications database	Notifications operator making a database query
	UAA user unsubscribes from a campaign in the v2 API	User ID	When the UAA user unsubscribes	The <code>unsubscribes</code> table in the Notifications database	Stored in the Notifications database	Notifications operator making a database query
<b>Reports/Logs</b>	UAA user unsubscribes	User email address	When the UAA user unsubscribes	Log output	Loggregator	Loggregator Firehose users

# Installing

In this section:

- **TAS for VMs**
  - TAS for VMs resource requirements
  - Quick start TAS for VMs configuration
  - TAS for VMs on vSphere requirements
  - vSphere virtual disk types
  - Deploying TAS for VMs with NSX-T networking
  - Deploying TAS for VMs to AVS
  - Deploying TAS for VMs to VCF
  - Deploying TAS for VMs to VMC
- **TAS for VMs [Windows]**
  - TAS for VMs [Windows] overview
  - Windows Diego Cell architecture
  - Installing and configuring TAS for VMs [Windows]
  - Downloading or creating Windows stemcells
  - Creating a Windows Stemcell for vSphere using stembuild
  - Windows Diego Cells in isolation segments
  - Windows authentication for .Net apps
  - Upgrading TAS for VMs [Windows] and Windows Stemcells
  - Migrating apps to TAS for VMs [Windows]
  - Troubleshooting Windows Diego Cells
- **Isolation Segment**
  - Installing Isolation Segment
  - Managing isolation segments
  - Routing for isolation segments
- **Upgrading TAS for VMs**
  - Configuring TAS for VMs for upgrades
  - What happens during TAS for VMs upgrades
  - cf push availability during TAS for VMs upgrades

## TAS for VMs

The VMware Tanzu Application Service for VMs runtime is available in two forms, both available to download from the [VMware Tanzu Application Service for VMs](#) page on Broadcom Support:

- TAS for VMs
- Small Footprint TAS for VMs

For more information about the difference, see the following sections.

## When should you use Small Footprint TAS for VMs?

Use Small Footprint TAS for VMs for smaller foundations on which you intend to host 2500 or fewer application instances, as described in [Limitations](#). If you want to use Small Footprint TAS for VMs in a production environment, ensure the limitations described are not an issue in your use case.

Small Footprint TAS for VMs is compatible with VMware Tanzu Operations Manager (Tanzu Operations Manager) service tiles.

Small Footprint TAS for VMs is also ideal for the following use cases:

- **Proof-of-concept installations:** Deploy Tanzu Operations Manager quickly and with a small footprint for evaluation or testing purposes.
- **Sandbox installations:** Use Small Footprint TAS for VMs as an Tanzu Operations Manager operator sandbox for tasks such as testing compatibility.
- **Service tile R&D:** Test a service tile against Small Footprint TAS for VMs instead of a standard TAS for VMs deployment to increase efficiency and reduce cost.

## Small Footprint TAS for VMs Limitations

Small Footprint TAS for VMs has the following limitations:

- **Number of application instances:** The tile is not designed to support large numbers of app instances. You cannot scale the number of Compute VMs beyond 10 instances in the [Resource Config](#) pane. Small Footprint TAS for VMs is designed to support 2500 or fewer apps.
- **Management plane availability during tile upgrades:** You might not be able to perform management plane operations like deploying new applications and accessing APIs for brief periods during tile upgrades. The management plane is located on the Control VM.
- **Application availability during tile upgrades:** If you require availability during tile upgrades, you must scale your Compute VMs to a highly available configuration. Ensure sufficient capacity exists to move app instances between Compute VM instances during the upgrade.

## TAS for VMs requirements

For information about resource requirements for TAS for VMs and Small Footprint TAS for VMs, see [TAS for VMs resource requirements](#).

## TAS for VMs Resource Requirements

The general requirements for deploying and managing an installation of Tanzu Operations Manager and VMware Tanzu Application Service for VMs (TAS for VMs) are:

- A wildcard DNS record that points to your Gorouter or load balancer. Also, you can use a service such as xip.io. For example, `203.0.113.0.xip.io`.
  - TAS for VMs gives each app its own hostname in your app domain.
  - With a wildcard DNS record, every hostname in your domain resolves to the IP address of your Gorouter or load balancer, and you do not have to configure an A record for each app hostname. For example, if you create a DNS record `*.example.com` pointing to your load balancer or Gorouter, every app deployed to the `example.com` domain resolves to the IP address of your Gorouter.
- At least one wildcard TLS certificate that matches the DNS record you set up, `*.example.com`.
- Sufficient IP allocation:
  - One static IP address for one of your Gorouters.
  - One static IP address for each job in the TAS for VMs tile. For a full list, see the **Resource Config** pane for each tile.
  - One static IP address for each of the following jobs:
    - Consul
    - NATS
    - File Storage
    - MySQL Proxy
    - MySQL Server
    - Backup Restore Node
    - Router
    - MySQL Monitor
    - Diego Brain
    - TCP Router
  - One IP for each VM instance created by the service.
  - An additional IP address for each compilation worker. The formula for total IPs needed is `IPs needed = static IPs + VM instances + compilation workers`.

VMware recommends that you allocate at least 36 dynamic IP addresses when installing TAS for VMs. BOSH requires additional dynamic IP addresses during installation to compile and deploy VMs, install TAS for VMs, and connect to services.

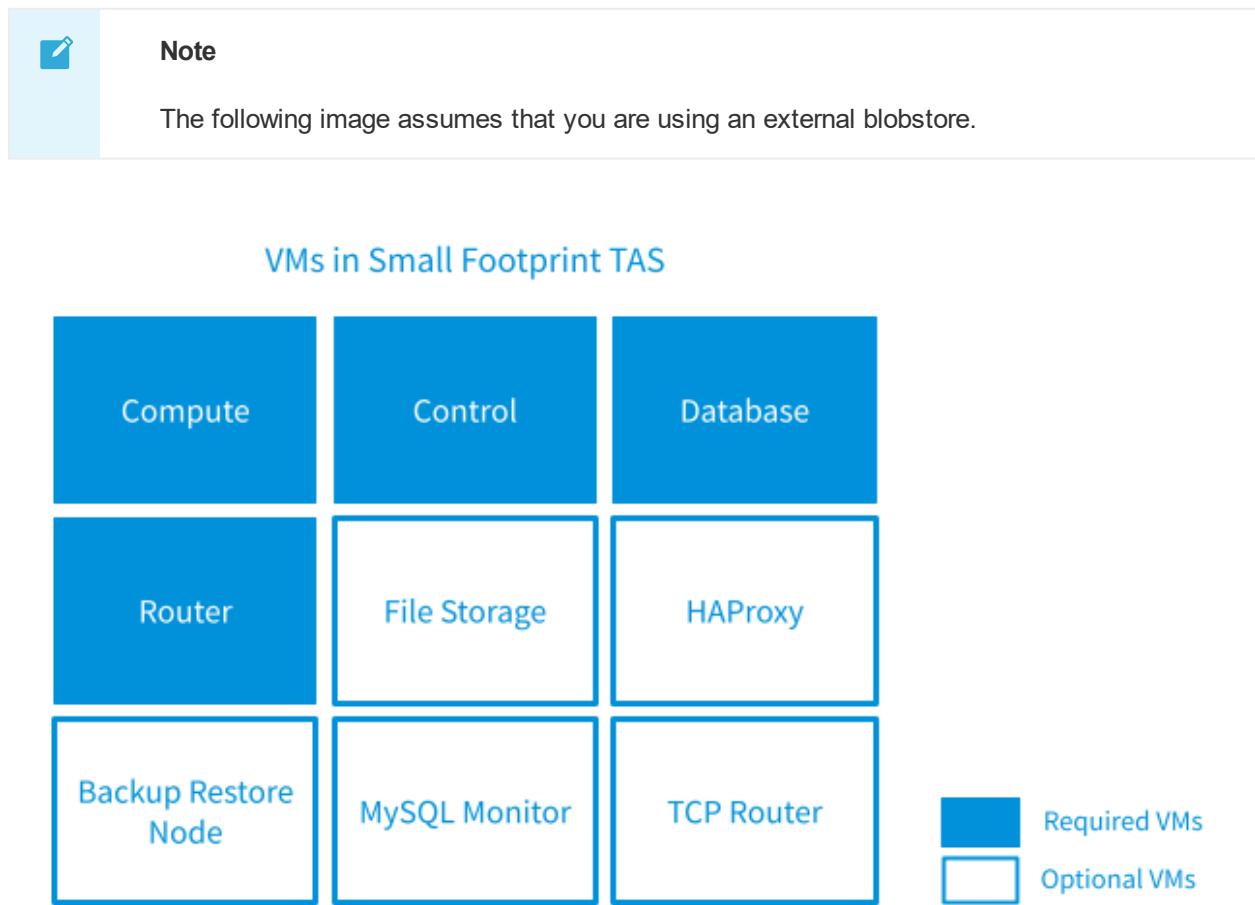
- One or more NTP servers if not already provided by your IaaS.
- (**Recommended**) A network without DHCP available for deploying the TAS for VMs VMs.

If you have DHCP, see [Troubleshooting Deployment Problems](#) in the Tanzu Operations Manager documentation for information about avoiding issues with your installation.

- **(Optional)** External storage. When you deploy TAS for VMs, you can select internal file storage or external file storage, either network-accessible or IaaS-provided, as an option in the TAS for VMs tile. VMware recommends using external storage whenever possible. For more information about how file storage location affects platform performance and stability during upgrades, see [Configure File Storage](#) in *Configuring TAS for VMs for Upgrades*.
- **(Optional)** External databases. When you install TAS for VMs, you can select internal or external databases for the BOSH Director and for TAS for VMs. VMware recommends using external databases in production deployments. An external database must be configured to use the UTC timezone.
- **(Optional)** External user stores. When you deploy TAS for VMs, you can select a SAML user store for Tanzu Operations Manager or a SAML or LDAP user store for TAS for VMs, to integrate existing user accounts.
- The most recent version of the [Cloud Foundry Command Line Interface](#) (cf CLI).

## Differences in Small Footprint TAS for VMs

You can deploy Small Footprint TAS for VMs with a minimum of four VMs, as shown in the following image.



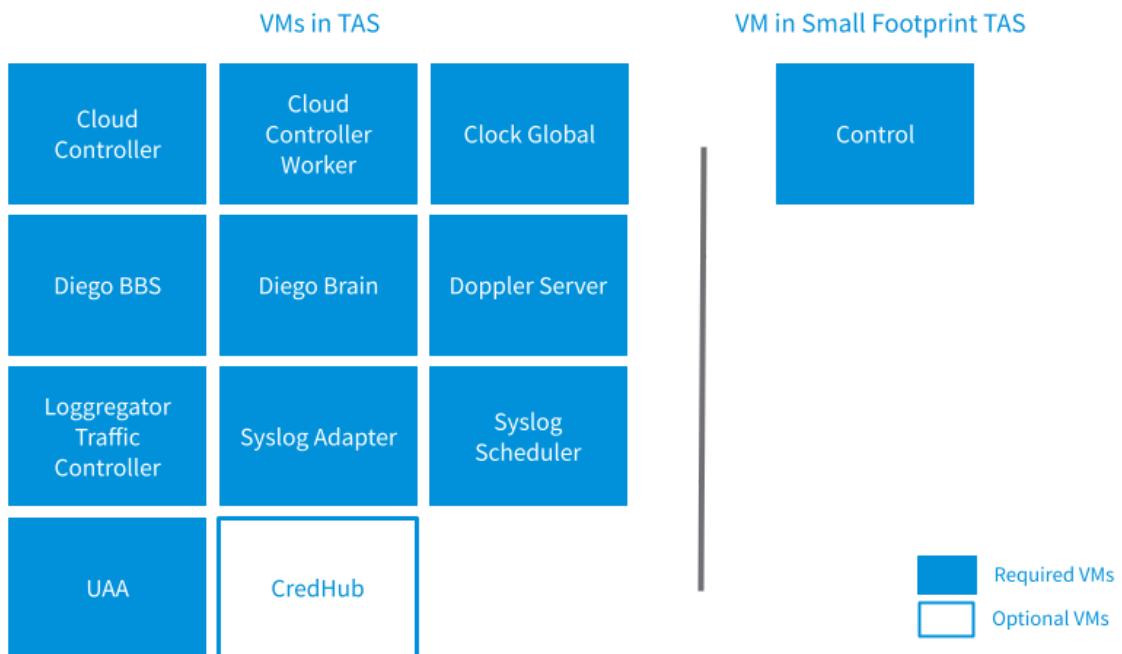
To reduce the number of VMs required for Small Footprint TAS for VMs, the Control and Database VMs include co-located jobs that run on a single VM in TAS for VMs. See the next sections for details.

For more information about the components mentioned on this page, see [TAS for VMs Components](#).

## Control VM

The Control VM includes the TAS for VMs jobs that handle management plane operations, app life cycles, logging, and user authorization and authentication. Additionally, all errands run on the Control VM, eliminating the need for a VM for each errand and significantly reducing the time it takes to run errands.

The following image shows all the jobs from TAS for VMs that are co-located on the Control VM in Small Footprint TAS for VMs. Small Footprint TAS for VMs co-locates 11 VMs onto 1 VM called Control. The 11 VMs are Cloud Controller, Cloud Controller Worker, Clock Global, Diego BBS, Diego Brain, Doppler Server, Loggregator Traffic Controller, Syslog Adapter, Syslog Scheduler, UAA, and optionally, CredHub.



## Database VM

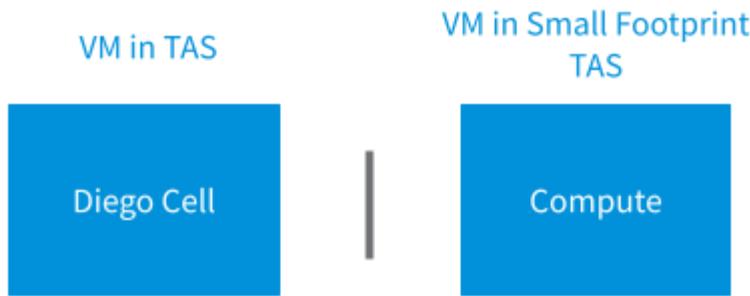
The Database VM includes the TAS for VMs jobs that handle internal storage and messaging.

The following image shows all the jobs from TAS for VMs that are co-located on the Database VM in Small Footprint TAS for VMs. Small Footprint TAS for VMs Condenses 3 VMs onto 1 VM called Database. The three TAS for VMs VMs are NATS, MySQL Proxy, and MySQL Server. The MySQL Proxy and MySQL Server are optional VMs.



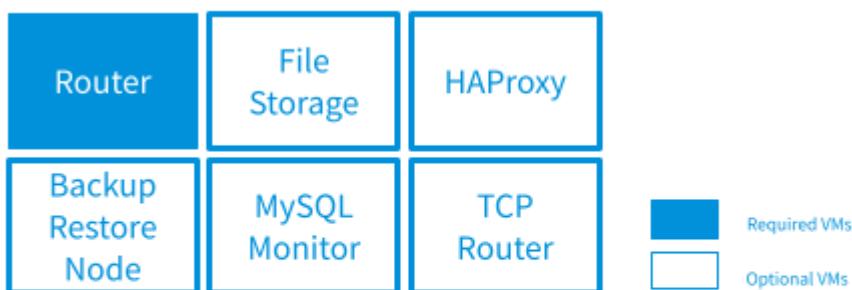
## Compute VM

The Compute VM is the same as the Diego Cell VM in TAS for VMs.



## Other VMs (unchanged)

For the other VMs, they perform the same functions in both versions of the TAS for VMs tile. The Router, File Storage, Backup Restore Node, MySQL Monitor, and TCP Router VMs are the same in both TAS for VMs and Small Footprint TAS for VMs.



## Instance number and scaling requirements

By default, TAS for VMs deploys the number of VM instances required to run a highly available configuration. If you are deploying a test or sandbox TAS for VMs that does not require HA, then you can scale down the number of instances in your deployment.

For information about the number of instances required to run a minimal, non-HA TAS for VMs deployment, see [Scaling TAS for VMs](#).

## Configuring TAS for VMs

In this section:

- [Prerequisites](#)
- [Add TAS for VMs to Tanzu Operations Manager](#)
- **Configure TAS features**
  - [Domains](#)
  - [Networking](#)
  - [App containers](#)

- App Developer Controls
  - Authentication and enterprise SSO
  - UAA
  - CredHub
  - Databases
  - File Storage
  - Cloud Controller
  - Smoke tests
  - Errands
  - Resources
  - Stemcell
  - Complete the TAS for VMs Installation
- **Configure optional features**
    - Internal MySQL
    - System logging
    - Custom branding and Apps Manager
    - Email notifications
    - App Autoscaler
    - Advanced features
    - Metric Registrar

## VMware Tanzu Application Service for VMs Overview

You can configure VMware Tanzu Application Service for VMs (TAS for VMs) as part of deploying Operations Manager.

## Prerequisites

Before you begin, you must:

- Ensure that you have successfully completed the steps to prepare your environment for Operations Manager and install and configure the BOSH Director. For more information, see the configuration topic for your IaaS in the [VMware Tanzu Operations Manager documentation](#).
- If you plan to install the Operations Manager IPsec add-on, you must do so before installing any other tiles. VMware recommends installing IPsec immediately after Tanzu Operations Manager and before installing the TAS for VMs Runtime tile. For more information, see [Installing IPsec for VMware Tanzu](#).

## Add TAS for VMs to Tanzu Operations Manager

Before you configure TAS for VMs, you must add the TAS for VMs tile to your Tanzu Operations Manager Installation Dashboard.

To add the TAS for VMs tile to your Tanzu Operations Manager Installation Dashboard:

1. If you have not already downloaded TAS for VMs, log in to [Broadcom Support](#) and click **VMware Tanzu Application Service for VMs**.
2. From the **Releases** drop-down menu, select the release to install and choose one of the following:
  1. Click **VMware Tanzu Application Service for VMs** to download the Pivotal Application Service `.pivotal` file.
  2. Click **Small Footprint TAS for VMs** to download the Small Footprint TAS for VMs `.pivotal` file.
3. Go to Tanzu Operations Manager Installation Dashboard.
4. Click **Import a Product** to add your tile to VMware Tanzu Operations Manager. For more information, see [Adding and Deleting Products](#).
5. Click the **VMware Tanzu Application Service for VMs** tile in the Installation Dashboard.

## Assign AZs and networks

For Azure environments, this configuration pane is **Assign Networks** and does not include AZ configuration.

In the **Assign AZ and Networks** pane, you assign jobs to your Availability Zones (AZs) and networks.

To configure the **Assign AZ and Networks** pane:

1. Select **Assign AZ and Networks**.
2. Under **Balance other jobs**, select all AZs. Tanzu Operations Manager balances instances of jobs with more than one instance across the AZs that you specify.  
For production deployments, VMware recommends at least three AZs for a highly available installation of TAS for VMs.
3. From the **Network** drop-down menu, select the network where you want to run TAS for VMs.
4. Click **Save**.

## Configure TAS features

In this section:

- [Domains](#)
- [Networking](#)
- [App containers](#)
- [App Developer Controls](#)
- [Authentication and enterprise SSO](#)
- [UAA](#)
- [CredHub](#)

- [Databases](#)
- [File Storage](#)
- [Cloud Controller](#)
- [Smoke tests](#)
- [Errands](#)
- [Resources](#)
- [Stemcell](#)
- [Complete the TAS for VMs Installation](#)

## Domains

In the **Domains** pane, you configure a wildcard DNS record for both the apps domain and system domain.

To configure the **Domains** pane:

1. Select **Domains**.
2. Enter the name of your system domain in the **System domain** field. The system domain defines your target when you push apps to TAS for VMs, such as your load balancer. TAS for VMs assigns system components such as UAA and Apps Manager to subdomains under this domain.
3. Enter the name of your apps domain in the **Apps domain** field. The apps domain is the default domain that apps use for their hostnames. TAS for VMs hosts each app at subdomains under this domain. You can use the Cloud Foundry Command Line Interface (cf CLI) to add or delete subdomains assigned to individual apps.
4. Click **Save**.

For additional guidance based on your installation method, see the table below:

Installation Method	Guidance
Manual	Enter the domains you created when preparing your environment for Operations Manager.
Terraform	Enter the values for <code>sys\_domain</code> and <code>apps\_domain</code> from the Terraform output.

VMware recommends that you use the same domain name but different subdomain names for your system and app domains. Doing so allows you to use a single wildcard certificate for the domain while preventing apps from creating routes that overlap with system routes.

## Networking

In the **Networking** pane, you configure security and routing services for your IaaS.

To configure the **Networking** pane:

## Gorouter IPs

For **Gorouter IPs**, see the guidance below:

- For **AWS**, **Azure**, and **GCP**, leave these fields blank. You do not need to configure these fields when deploying TAS for VMs on these infrastructures.
- For **OpenStack** and **vSphere**, use the table below to determine how to configure this field:



If you choose to assign specific IP addresses in the **Gorouter IPs** field, ensure that these IP addresses are in the subnet that you configured for TAS for VMs in Tanzu Operations Manager.

#### **Gorouter IPs field**

- Choose IP addresses from the subnet you configured in Tanzu Operations Manager.
- Enter these IP addresses in **Gorouter IPs**. You should specify more than one IP address for high availability. The IP addresses must be within your subnet CIDR block.
- Configure your load balancer to forward requests for the domains that you have configured for your deployment to these IP addresses.

## SSH proxy IPs and TCP router IPs

For **SSH Proxy IPs** and **TCP router IPs**, see the guidance below:

- For **AWS**, **Azure**, and **GCP**, leave these fields blank. You do not need to configure these fields when deploying TAS for VMs on these infrastructures.
- For **OpenStack** and **vSphere**:
  - (Optional) In **SSH Proxy IPs**, add the IP address for your Diego Brain, which accepts requests to SSH into app containers on port `2222`.
  - (Optional) In **TCP router IPs**, add the IP addresses you want to assign to the TCP routers. You configure TCP routing at the bottom of this pane.



If you configure mutual TLS app identity verification, app containers accept incoming communication only from the Gorouter. This deactivates TCP routing.

## Certificates and private keys for the Gorouter

Under **Certificates and private keys for the Gorouter**, you must provide at least one certificate and private key pair for the Gorouter. The Gorouter is configured to receive TLS communication by default. You can configure multiple certificates for the Gorouter.



When providing custom certificates, enter them in this order: `wildcard`, `Intermediate`, `CA`. For more information, see the [DigiCert documentation](#).

- To configure a certificate and private key for the Gorouter:
  - Click **Add**. The Gorouter uses the certificate you configure as the default certificate.
  - For **Name**, enter a human-readable name that describes the use of this certificate.

3. For **Certificate and private key**, choose one of the following options:
  - Enter a certificate signed by a Certificate Authority (CA).
  - Click **Generate RSA Certificate**. Clicking this link causes the Tanzu Operations Manager CA to automatically generate a certificate.

For the values to use, see [Providing a Certificate for your TLS termination point](#).



If you configured your Tanzu Operations Manager front end without a certificate, you can use this new certificate to finish configuring Tanzu Operations Manager. To configure your Tanzu Operations Manager front end certificate, see the [Tanzu Operations Manager documentation](#).

2. (Optional) To configure multiple certificates for the Gorouter:
  1. For each additional certificate and key pair, click **Add**.
  2. Configure the fields you configured for the first certificate and key pair in the previous step. For more information about generating certificates in Tanzu Operations Manager for your wildcard system domains, see [Providing a Certificate for Your TLS Termination Point](#).



Ensure that you add any certificates that you generate in this pane to your infrastructure load balancer.

## CA certificates for Gorouter

(Optional) When validating requests using mutual TLS to back ends and route services, the Gorouter trusts multiple CAs by default. To configure which CA certificates Gorouter trusts, choose one of the following options:

- For backwards compatibility with older versions of Isolation Segment:
  1. Under **Trusted CAs for client requests**, select **Trust the same CAs used for back ends and route services**.
- If you want the Gorouter to trust a particular set of CAs only:
  1. Under **Trusted CAs for client requests**, select **Only trust the following CAs**.
  2. For **Trusted client CAs**, enter the CAs you want the Gorouter to trust. The CAs you provide in this field are the only CAs that the Gorouter trusts for client requests. The Gorouter does not trust any well-known CAs that are provided with the stemcell.

## Trusted CA certificates

(Optional) When validating client requests using mutual TLS, the Gorouter trusts multiple certificate authorities (CAs) by default. For **Trusted CA certificates**, enter your CA certificates appended together into a single collection of PEM-encoded entries.

## HTTP/2 protocol

(Optional) The **Use HTTP/2 protocol** check box is selected by default. When this check box is selected, the Gorouter accepts all incoming HTTP/2 requests and sends HTTP/2 requests over app routes that support HTTP/2. To deactivate HTTP/2 ingress and egress for the Gorouter, deselect the **Use HTTP/2 protocol** check box. For more information about HTTP/2 routing, see [Supporting HTTP/2](#).

Deselecting the **Use HTTP/2 protocol** check box introduces potential breaking changes for app routes.

## Enable concurrent reads/writes for HTTP/1

(Optional) To enable concurrent request reads and response writes for HTTP/1 requests in the Gorouter, select the **Enable concurrent reads/writes for HTTP/1** check box. By default, the Gorouter consumes any unread portion of the request body before beginning to write the response, preventing handlers from concurrently reading from the request and writing the response. Selecting this check box deactivates that behavior and permits handlers to continue to read from the request while concurrently writing the response.

## TLS versions

Under **TLS versions**, select the range of TLS versions to use in Gorouter communications. The Gorouter supports TLS v1.2 to TLS v1.3 by default. If you need to accommodate clients that use an older version of TLS, select a lower minimum version. For a list of TLS ciphers supported by the Gorouter, see [TLS cipher suite support](#) in *Securing traffic into TAS for VMs*.

## Load balancing algorithm

(Optional) Under **Load balancing algorithm**, select either **Round-robin** or **Least-connection** as your load balancing algorithm for the Gorouter. **Round-robin** is selected by default, and VMware recommends this option for most use cases. Some use cases, such as those where apps have long-lived connections, might benefit from the least-connection algorithm. For more information, see [Router balancing algorithm](#) in *HTTP Routing*.

(Optional) Under **Load balancing algorithm availability zone preference**, select either **None** or **Locally-optimistic** as the availability zone preference for the Gorouter's load balancing algorithm. **None** is selected by default, and VMware does not recommend changing it. For more information, see [Load balancing availability zone preference](#) in *HTTP Routing*.

## Client IP logging

Under **Client IP logging**, **Log client IPs** is selected by default. To comply with the General Data Protection Regulation (GDPR), select one of the following options:

- If your load balancer exposes its own source IP address, select **Do not log X-Forwarded-For header**.
- If your load balancer exposes the source IP address of the originating client, select **Do not log source IP or X-Forwarded-For header**.

## TLS termination point

Under **TLS termination point**, configure how TAS for VMs handles `x-forwarded-client-cert` (XFCC) HTTP headers based on where TLS is terminated for the first time in your deployment. The table below indicates which option to choose based on your deployment configuration:

Deployment configuration	TLS option	Additional notes
<ul style="list-style-type: none"> <li>The load balancer is terminating TLS, and</li> <li>The load balancer is configured to put the client certificate from a mutual authentication TLS handshake into the X-Forwarded-Client-Cert HTTP header.</li> </ul>	Infrastructure load balancer	The Gorouter forwards the XFCC header when included in the request.
<ul style="list-style-type: none"> <li>The load balancer is configured to pass through the TLS handshake through TCP to instances of the Gorouter</li> </ul>	Gorouter	The Gorouter strips the XFCC header if it is included in the request and forwards the client certificate received in the TLS handshake in a new XFCC header.

 If you select the **The Gorouter does not request client certificates** option in the **Gorouter behavior for client certificate validation** field, the XFCC header cannot be delivered to apps.

For a description of the behavior of each configuration option, see [Forward Client Certificate to Apps in HTTP Routing](#).

## Gorouter behavior for client certificate validation

To configure Gorouter behavior for handling client certificates, select one of the following options under **Gorouter behavior for client certificate validation**:

- The Gorouter does not request client certificates:** The Gorouter does not request client certificates, so the client does not provide them, and the Gorouter does not validate them.
- The Gorouter requests but does not require client certificates:** The Gorouter requests client certificates in TLS handshakes and validates them when they are presented, but does not require them. This option is configured by default.
- The Gorouter requires client certificates:** The Gorouter validates that the client certificate is signed by a Certificate Authority (CA) that the Gorouter trusts. If the Gorouter cannot validate the client certificate, the TLS handshake fails.

Requests to the platform fail upon upgrade if your load balancer is configured with client certificates and the Gorouter is not configured with the appropriate CA. To mitigate this issue, select **The Gorouter does not request client certificates**.

## TLS cipher suites for the Gorouter

In the **TLS cipher suites for the Gorouter** field, review the TLS cipher suites for TLS handshakes between the Gorouter and front end clients such as load balancers. The default value for this field is `ECDHE-RSA-AES128-GCM-SHA256:TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384`.

To modify the default configuration, use an ordered, colon-separated list of Golang-supported TLS cipher suites in the OpenSSL format. This field does not apply to TLS v1.3. For TLS v1.3, the Gorouter only uses a set of default ciphers, and this is not configurable.

Verify that the ciphers are supported by any clients or front end components that initiate TLS handshakes with the Gorouter. For a list of TLS ciphers supported by the Gorouter, see [TLS Cipher Suite Support in Securing Traffic into TAS for VMs](#).

Verify that every client participating in TLS handshakes with the Gorouter has at least one cipher suite in common with the Gorouter.



Specify cipher suites that are supported by the versions configured under **Select the range of TLS versions supported by the Gorouter**. For example, TLS v1.3 does not support configuring cipher suites. If you select **TLSv1.3 only**, you cannot configure cipher suites for the Gorouter.

AWS Classic Load Balancers do not support the TAS for VMs default cipher suites. For more information about configuring your AWS load balancers and Gorouter, see [TLS Cipher suite support by AWS load balancers](#) in *Securing traffic into TAS for VMs*.

## Reject HTTP requests

(Optional) If you want the Gorouter to reject any unencrypted traffic, select the **Reject HTTP requests** check box. When this check box is selected, the Gorouter does not listen on port `80`.

## Do not use insecure cookie

(Optional) To configure the Gorouter to only generate secure cookies, select the **Do not use insecure cookies** check box.

## Enable Zipkin tracing headers on the Gorouter

(Optional) To deactivate the addition of Zipkin tracing headers on the Gorouter, deselect the **Enable Zipkin tracing headers on the Gorouter** check box. Zipkin tracing headers are enabled by default. For more information about using Zipkin trace logging headers, see [HTTP headers for zipkin tracing](#) in *HTTP routing*.

## W3C tracing headers on the Gorouter

(Optional) To activate the addition of W3C tracing headers on the Gorouter, select the **Add W3C tracing headers** check box. W3C tracing headers are disabled by default. Specify W3C tracing tenant ID name in **W3C tenant ID** field. If specified, the tracestate identifier will be "tenant-id@gorouter" where "tenant-id" is the value specified. If not specified, the tracestate identifier will be `gorouter`. For more information about using W3C trace logging headers, see [HTTP headers for W3C tracing](#) in *HTTP routing*.

## Allow the Gorouter to write access logs locally

(Optional) The **Allow the Gorouter to write access logs locally** check box is selected by default. VMware recommends deselecting this check box for high-traffic deployments, since logs might not be rotated fast enough and can fill up the disk.

## Requests to isolation segments

Under **Requests to isolation segments**, select one of the following options:

- **Accept requests for all isolation segments:** TAS for VMs Gorouters accept all traffic for apps deployed to an isolation segment created by the Isolation Segment tile. This option is selected by default.
- **Accept requests for some isolation segments:** TAS for VMs Gorouters to only accept requests for apps within specific isolation segments. If you select this option, you must also enter the names of the isolation segments for which you want TAS for VMs Gorouters to accept requests as a comma-separated list in **Isolation segment names**.
- **Reject requests for all isolation segments:** TAS for VMs Gorouters reject requests for apps within all isolation segments.

For more information, see [Installing Isolation Segment](#) and [Sharding Gorouters for isolation segments](#) in *Routing for isolation segments*.

## Accept PROXY requests

(Optional) By default, the Gorouter does not accept PROXY requests. To configure the Gorouter to accept PROXY requests, select the **Accept PROXY requests** check box. When you select this check box, client-side load balancers that stop TLS but do not support HTTP can pass along information from the originating client using the PROXY protocol. Configuring this option might impact Gorouter performance. For more information about configuring the Gorouter to accept PROXY requests, see the *About HTTP header forwarding* sections in [Securing Traffic into TAS for VMs](#).

## Route services

Under **Route services**, select either **Allow** or **Do not allow**. Route services are a class of marketplace services that perform filtering or content transformation on app requests and responses. For more information, see [Route Services](#) and [List Marketplace Services](#) in *Managing service instances with the cf CLI*.

- If you allow route services, you can also configure **Bypass security checks for route service lookup**. VMware recommends that you do not configure this field, due to potential security concerns. However, you might need to configure it if your load balancer requires mutual TLS from clients. For more information, see [Configuring Route Service lookup](#).

## Maximum connections per back end

(Optional) To limit the number of app connections to the back end, enter a value in **Maximum connections per back end**. Configuring this field allows you to prevent a poorly-behaving app from impacting other apps.

To allow an unlimited number of app connections to the back end, enter either `0` or no value. The default value is `500`.

To determine a value to configure in this field, review the highest number of concurrent connections that instances of the most popular apps in your deployment have received. You can determine the number of concurrent connections for an app by reviewing the `httpStartStop` event metrics emitted for each app request. If your deployment uses App Metrics, you can also find this information in your App Metrics deployment. For more information, see the [App Metrics documentation](#).

## Keep-alive connections

Under **Keep-alive connections**, select one of the following options:

- **Allow:** The Gorouter maintains TCP connections after receiving an HTTP response. This option is selected by default.
- **Do not allow:** The Gorouter closes TCP connections after receiving an HTTP response.

For more information, see [Keep-alive connections](#) in *HTTP Routing*.

## Back end request timeout and idle timeout

(Optional) For **Back end request timeout and idle timeout**, enter in seconds the amount of time that requests between the Gorouter and apps are allowed to remain idle before being closed. The default value is `900`. To accommodate larger uploads over connections with high latency, increase the value.

## Query parameter logging in Gorouter access logs

(Optional) To configure whether the Gorouter shows or hides GET request query parameters in access logs, select one of the following options under **Query parameter logging in Gorouter access logs**:

- **Log query parameters:** The Gorouter logs all query parameters without altering them.



If you select this option, GET request query parameters in Gorouter access logs might contain sensitive information.

- **Log a hash of query parameters:** The Gorouter hashes all query parameters.
- **Do not log query parameters:** The Gorouter hides all query parameters.

## Front end idle timeout

(Optional) To help prevent connections from your load balancer to the Gorouter from being closed prematurely, configure the **Front end idle timeout** field. The value you enter sets the duration, in seconds, that the Gorouter maintains an idle open connection from a load balancer that supports keep-alive connections.

To avoid the race condition where the load balancer sends a request before it discovers that the Gorouter has closed the connection, enter a value that is higher than the back end idle timeout for your load balancer.

For specific guidance and exceptions to this rule, see the following table:

IaaS	Guidance
AWS	Because AWS ELB has a default timeout of 60 seconds, VMware recommends configuring a value greater than <a href="#">60</a> .
Azure	By default, the Azure load balancer times out at 240 seconds without sending a TCP RST to clients. To force the load balancer to send the TCP RST, VMware recommends configuring a value lower than <a href="#">240</a> .
GCP	GCP has a default timeout of 600 seconds. For GCP HTTP load balancers, VMware recommends configuring a value greater than <a href="#">600</a> . For GCP TCP load balancers, VMware recommends configuring a value less than <a href="#">600</a> to force the load balancer to send a TCP RST.
Other	Configure a value greater than that of the back end idle timeout for your load balancer.



Do not set a front end idle timeout lower than six seconds.

(Optional) For **Gorouter drain timeout**, enter in seconds the amount of time that the Gorouter continues to serve existing connections before shutting down. After the timeout is reached, all remaining connections are terminated so the Gorouter can restart. To reduce the drain time during deployments, enter a value that is lower than the values in **Back end request and idle timeout** and **Front end idle timeout**. The default value is [900](#).

## Load balancer unhealthy threshold

(Optional) Increase the value of **Load balancer unhealthy threshold** to specify the amount of time, in seconds, that the Gorouter continues to accept connections before shutting down. During this period, health checks might report the Gorouter as unhealthy, which causes load balancers to failover to other Gorouters. Configure a value that is greater than or equal to the maximum time it takes your load balancer to consider a Gorouter instance unhealthy, given repeated failed health checks.

## Load balancer healthy threshold

(Optional) Modify the value of **Load balancer healthy threshold**. This field specifies the amount of time, in seconds, to wait until declaring the Gorouter instance started. This allows an external load balancer enough time to register the Gorouter instance as healthy.

## HTTP headers to log

(Optional) If app developers in your organization want certain HTTP request headers to appear in their app logs with information from the Gorouter, enter them as a comma-separated list under **HTTP headers to log**. For example, to support app developers that deploy Spring apps to TAS for VMs, you can enter Spring-specific HTTP request headers.

The Gorouter always logs the following HTTP request headers:

- [Referer](#)
- [User-Agent](#)

- `X-Forwarded-For`
- `X-Forwarded-Proto`
- `X-Vcap-Request-ID`

## Maximum request header size

For **Maximum request header size**, enter the maximum total size (in KB) that all headers in a request to the Gorouter might have combined, including header keys, header values, and all values in the request line. Configuring this field allows TAS for VMs to prevent denial-of-service attacks from requests with large headers.

Requests with headers that exceed this limit cause a [431](#) status code. Enter a value between [1](#) and [1024](#). VMware recommends configuring a limit of [48](#). To account for backwards compatibility, you can configure a higher limit, if required. Configuring this field does not limit the size of the request body.



If you do not configure **Loggregator port**, it defaults to [443](#). For AWS environments that are not using an Application Load Balancer, enter [4443](#).

## Container network interface plugin

For **Container network interface plugin**, select one of the following options:

- **Silk**: The default container network interface (CNI) for TAS for VMs.
- **External**: Select this option if you are deploying the [VMware NSX-T Container plug-in](#) for TAS for VMs.

If you select **External**, follow the procedure in [Deploying TAS for VMs with NSX-T Networking](#) in addition to the procedures in this topic.

The NSX-T integration only works for new installations of TAS for VMs. If your TAS for VMs tile is already deployed and configured to use Silk as its CNI, you cannot re-configure your deployment to use NSX-T.

If you selected **Silk** in the previous step, review the following fields:

1. (Optional) For **App network maximum transmission unit**, enter an MTU value in bytes. The default value is [1454](#). Some configurations might require a smaller MTU value. For example, networks that use GRE tunnels might require a smaller MTU.  
For Azure environments, VMware recommends entering [1400](#) or lower to prevent Azure from fragmenting the packets. For more information, see the [Azure documentation](#).
2. (Optional) For **Overlay subnet**, enter an IP range for the overlay network. If you do not set a custom range, Tanzu Operations Manager uses [10.255.0.0/16](#). The overlay network IP range you configure must not conflict with any other IP addresses in your network.  
Editing this property might cause container-to-container (C2C) networking downtime and security implications the next time you redeploy TAS for VMs.
3. For **Overlay subnet prefix length per Diego Cell**, enter in bits the length of the prefix for subnets allocated per Diego Cell. For example, for a [/24](#) subnet, enter [24](#). The default value is [24](#). The minimum value you can configure is [2](#). The maximum value you can configure is [30](#). Configuring a

smaller subnet allows more Diego Cells per TAS for VMs deployment, but fewer apps per Diego Cell. Conversely, configuring a larger subnet allows more apps per Diego Cell, but fewer Diego Cells per TAS for VMs deployment. The values that you configure in the **Overlay subnet** and **Overlay subnet prefix length per Diego Cell** fields determine the exact number of Diego Cells allowed per TAS for VMs deployment and apps allowed per Diego Cell.

Editing this property might cause C2C networking downtime and security implications the next time you redeploy TAS for VMs.

4. In the **VXLAN tunnel endpoint port** field, enter a UDP port number. This is the host port that receives VXLAN packets. If you do not set a custom port, Tanzu Operations Manager uses [4789](#).
  - For **Denied logging interval**, enter the per-second rate limit for packets blocked by either a container-specific networking policy or by App Security Group (ASG) rules applied across the space, org, or deployment. The default value is [1](#). For more information, see [Policies in container-to-container networking](#) and [Restricting app access to internal TAS for VMs Components](#).
  - For **UDP logging interval**, enter the per-second rate limit for UDP packets sent and received. The default value is [100](#).
  - To allow logging for app traffic, select the **Log traffic for all accepted and denied app packets** check box. Selecting this check box increases log volume. For more information, see [App traffic logging](#) in [Configuring logging in TAS for VMs](#).
5. The **Enforce Silk network policy** check box is selected by default. To deactivate Silk network policy enforcement between apps, deselect this check box. Deactivating the network policy enforcement allows all apps to send network traffic to all other apps in your TAS for VMs deployment, despite no policy specifically allowing it.  
Deactivating the **Enforce Silk network policy** check box allows all app containers to access any other app container with no restrictions.

For **DNS search domains**, enter the domains for your app containers to use as DNS search domains as a comma-separated list. Your containers append these search domains to host names to resolve them into full domain names.

## Database connection timeout

For **Database connection timeout**, enter in seconds the connection timeout for clients of the policy server and Silk databases. The default value is [120](#). You might need to increase this value if your deployment experiences timeout issues related to container-to-container networking.

## Enable TCP routing

TCP routing is deactivated by default. You can enable this feature if your DNS sends TCP traffic through a load balancer rather than directly to a TCP router. To enable TCP routing:

1. Under **TCP routing**, select **Enable**.



If you have mutual TLS app identity verification enabled, app containers accept incoming communication only from the Gorouter. This deactivates TCP routing.

2. For **TCP routing ports**, enter one or more ports to which the load balancer forwards requests. To support multiple TCP routes, VMware recommends allocating multiple ports. Do one of these steps:
  - o To allocate a single port or range of ports, enter a single port or a range of ports.



If you configured AWS for Operations Manager manually, enter `1024-1123` which corresponds to the rules you created for `pcf-tcp-elb`.

- o To allocate a list of ports:
    1. Enter a single port in the **TCP routing ports** field.
    2. After deploying TAS for VMs, follow the procedure in [Router Groups: Modify TCP port reservations](#).
3. (Optional) For **TCP request timeout**, modify the default value of 300 seconds. This field determines when the TCP router closes idle connections from clients to apps that use TCP routes. You might want to increase this value to enable developers to push apps that require long-running idle connections with clients.
  4. Follow these additional instructions based on your IaaS:

IaaS	Instructions
GCP	Specify the name of a GCP TCP load balancer in the <b>LOAD BALANCER</b> field of the <b>TCP Router</b> job in the <b>Resource Config</b> pane. You configure this later on in TAS for VMs. For more information, see <a href="#">Configure Resources</a> .
AWS	Specify the name of a TCP ELB in the <b>LOAD BALANCER</b> field of the <b>TCP Router</b> job in the <b>Resource Config</b> pane. You configure this later on in TAS for VMs. For more information, see <a href="#">Configure Resources</a> .
Azure	Specify the name of a Azure load balancer in the <b>LOAD BALANCER</b> field of the <b>TCP Router</b> job in the <b>Resource Config</b> pane. You configure this later on in TAS for VMs. For more information, see <a href="#">Configure Resources</a> .
OpenStack and vSphere	<ol style="list-style-type: none"> <li>1. Return to the top of the <b>Networking</b> pane.</li> <li>2. In the <b>TCP router IPs</b> field, ensure that you have entered IP addresses that are within your subnet CIDR block. These are the same IP addresses you configured your load balancer with in the <a href="#">Pre-Deployment Steps</a> in <i>Enabling TCP Routing</i>, unless you configured DNS to resolve the TCP domain name directly to an IP you have chosen for the TCP router.</li> </ol>

#### Additional settings:

- (Optional) For additional security, under **HTTP response headers to remove**, enter headers that you want the Gorouter to remove from app responses in the **Header name** field.
- (Optional) Under **Sticky session cookies**, enter one or more sticky session cookie names in the **Cookie name** field. The default cookie name is `JSESSIONID`. Some apps require a different cookie name. For example, Spring WebFlux requires `SESSION` for the cookie name. Gorouter uses these cookies to support session affinity, or *sticky sessions*. For more information, see [Session Affinity](#) in *HTTP Routing*.
- For **Internal route staleness threshold**, enter the amount of time, in seconds, that the Service Discovery Controller waits to receive messages about routes before pruning them from the routing table.

Remember to click **Save**.

## App containers

In the **App Containers** pane, you configure microservice frameworks, private Docker registries, and other services that support your apps at the container level.

To configure the **App Containers** pane:

1. Select **App Containers**.
2. The **Allow custom buildpacks** check box governs the ability to pass a custom buildpack URL to the `-b` option of the `cf push` command. This check box is selected by default, letting developers use custom buildpacks when deploying apps. To disallow the use of custom buildpacks, deselect the **Allow custom buildpacks** check box. For more information about custom buildpacks, see [Using Classic Buildpacks in Cloud Foundry](#).
3. The **Allow SSH access to app containers** check box controls SSH access to app instances. To allow SSH access across your deployment, select the **Allow SSH access to app containers** check box. To prevent all SSH access, deselect the **Allow SSH access to app containers** check box. For more information about SSH access permissions at the space and app level, see [App SSH overview](#).



To allow SSH traffic, ensure that port `2222` is open on your load balancer.

You can give SSH access to an app only if an admin assigns you a Space Developer role in the space where the app runs. For more information, see [Manage App Space Roles](#) in *Managing User Roles with Apps Manager*.

4. To allow SSH access for new apps by default in spaces that allow SSH, select the **Allow SSH access when an app is created** check box. If you deselect this check box, developers can still allow SSH access after pushing their apps by running `cf enable-ssh APP-NAME`, where `APP-NAME` is the name of the app.
5. (Optional) To give apps that generally stay within their CPU entitlements priority access to extra CPU during CPU bursts, select the **Allow CPU burst optimization** check box. This check box is selected by default. When this check box is selected, apps that generally stay within their CPU entitlements have higher-priority access to extra CPU than apps that generally exceed their CPU entitlements. When this check box is deselected, all apps have equal access to extra CPU during CPU bursts. Whether you select or deselect this check box, all apps are always guaranteed the amount of CPU that is within their CPU entitlements.
6. Under **Gorouter app identity verification**, choose how the Gorouter verifies app identity to allow encryption and prevent misrouting:



This feature does not work if **The Gorouter does not request client certificates** is selected under **Gorouter behavior for client certificate validation** in the **Networking** pane.

- **The Gorouter uses TLS to verify app identity:** Allows the Gorouter to verify app identity using TLS. This option is selected by default.
- **The Gorouter and apps use mutual TLS to verify each other's identity:** Allows your apps and the Gorouter to verify each other's identity using mutual TLS (mTLS). This option deselects TCP routing because app containers accept incoming communication only from the Gorouter.

For more information, see [Preventing misrouting in HTTP Routing](#).

7. To configure TAS for VMs to run app instances in Docker containers, enter a comma-separated list of their IP address ranges in the **Docker registry allow list** field. For more information, see [Using Docker Registries](#).
8. Under **Diego Cell disk cleanup scheduling**, select one of the following options:
  - **Never clean up disk space:** Diego Cells never schedule disk cleanups. VMware does not recommend selecting this option for production environments.
  - **Routinely clean up disk space:** Diego Cells schedule a disk cleanup whenever a container is created. Running the disk cleanup process this frequently can negatively impact Diego Cell performance.
  - **Clean up disk space once usage fills disk:** Diego Cells schedule a disk cleanup only when disk use encroaches on the space reserved for other jobs. If you select this option, enter in MB the amount of space that you want the garbage collection algorithm to keep free for other jobs in the **Reserved disk space for other jobs** field. For more information about the configuration options and how to configure a reserved amount, see [Configuring Diego Cell Disk Cleanup Scheduling](#).
9. The **Allow containerd delegation** check box governs whether Garden delegates container create and destroy operations to the containerd tool. This check box is selected by default. To disallow Garden delegating container create and destroy operations to containerd, deselect the **Allow containerd delegation** check box. For more information about the containerd tool, see the [containerd](#) website.
10. For **Maximum in-flight container starts**, enter the maximum number of started instances you want to allow across all Diego Cells in your deployment. Entering `0` sets no limit. The default value is `200`. For more information, see [Set a maximum number of started containers](#) in *Configuring TAS for VMs for Upgrades*.
11. Under **NFSv3 volume services**, select **Allow** or **Do not allow**. Deploying NFS volume services allows app developers to bind existing NFS volumes to their apps for shared file access. For more information, see [Enabling Volume Services](#).



In a new installation of TAS for VMs, the **NFSv3 volume services** check box is selected by default. When you upgrade from an earlier version of TAS for VMs, the **NFSv3 volume services** check box is automatically configured the same way it was configured in the earlier version.

12. (Optional) To configure LDAP for NFSv3 volume services:

- For **LDAP service account user**, enter the user name of the service account in LDAP that manages volume services.
- For **LDAP service account password**, enter the password for the service account.
- For **LDAP server host**, enter the hostname or IP address of the LDAP server.
- For **LDAP server port**, enter the LDAP server port number. If you do not specify a port number, Tanzu Operations Manager uses [389](#).
- For **LDAP user search base**, enter the location in the LDAP directory tree from which any LDAP user search begins. The typical LDAP search base matches your domain name. For example, a domain named `cloud.example.com` typically uses `ou=Users,dc=example,dc=com` as its LDAP user search base.
- (Optional) If your LDAP server supports TLS and you want to allow TLS connections from the NFS driver to your LDAP server, enter the root certificate from your CA certificate or your self-signed certificate in **LDAP server CA certificate**.



UAA can parse only one certificate entered into this text box. If you enter multiple certificates, UAA uses only the first one you entered and ignores the rest. You need one root certificate or self-signed certificate.

13. (Optional) To deploy SMB volume services, select the **Allow SMB volume services** check box. Deploying SMB volume services allows developers to bind existing SMB shares to their apps. For more information, see [Enabling Volume Services](#).



If you deploy SMB volume services, you must set the **SMB Broker Errand** to **On** in the **Errands** pane.

14. (Optional) To force all SMB shares to mount with the `noserverino` mount option, select the **Force noserverino mount option for SMB mounts** check box.
15. (Optional) To modify the amount of time that health checks wait to receive a healthy response from an app before the app is declared unhealthy, enter the number of seconds you want the timeout period to last in **Default health check timeout**. If the health check does not receive a healthy response from a newly-started app within the configured timeout period, then the app is declared unhealthy. The default value is [60](#). The maximum value you can configure is [600](#).  
If you decrease the default health check timeout below its current value, existing apps with startup times greater than the new value might fail to start up.
16. (Optional) To limit the number of log lines an app instance can generate per second, select **Enable** under **App log rate limit (deprecated)** and enter an integer for **Maximum app log lines per second**. At minimum, VMware recommends using the default limit of [100](#). This feature is deactivated by default.



This method of limiting log output from applications is deprecated. VMware recommends using the log rate limiting quota feature which provides more granular control over application log output.

17. Click **Save**.

## App Developer Controls

In the **App Developer Controls** pane, you configure restrictions and default settings for your apps.

To configure the **App Developer Controls** pane:

1. Select **App Developer Controls**.
2. Enter the **Maximum file upload size** in MB. This is the maximum size of an app upload, including the buildpack.
3. Enter the **Maximum package size** in MB. This is the maximum total size of an app's files.
4. Enter the **Default app memory** in MB. This is the default amount of memory allocated to a newly-pushed app if no value is specified when pushing the app.
5. Enter the **Default app memory quota per org** in MB. This is the default memory limit for all apps in an org. The specified limit only applies to the first installation of TAS for VMs. After the initial installation, operators can use the cf CLI to change the default value.
6. For **Maximum disk quota per app** in MB, enter in MB the maximum amount of disk allowed per app.

If you allow developers to push large apps, TAS for VMs might have trouble placing them on Diego Cells. Additionally, in the event of a system upgrade or an outage that causes a rolling deploy, larger apps might not successfully redeploy if there is insufficient disk capacity. Monitor your deployment to ensure that your Diego Cells have sufficient disk to run your apps.

7. Enter the **Default disk quota per app** in MB. This is the amount of disk allocated by default to a newly-pushed app if no value is specified when pushing the app.
8. Enter the **Default log rate limit per app** in bytes per second. This is the number of logs that a newly-pushed app is allowed to send to Loggregator if no value is specified when pushing the app.

To deactivate this feature and allow app instances to send an unlimited number of logs to Loggregator, enter `-1`. App log rate limiting is deactivated by default. VMware recommends activating this feature to prevent app instances from overloading the Loggregator Agent with logs, so the Loggregator Agent does not drop logs for other app instances on the same Diego Cell.

9. Enter the **Default service instance quota per org**. The specified limit only applies to the first installation of TAS for VMs. After the initial installation, operators can use the cf CLI to change the default value.
10. Enter the **Staging timeout** in seconds. When you stage an app droplet with the Cloud Controller, the server times out after the number of seconds you specify in this field.
11. For **Internal domains**, enter one or more domains that apps use for internal DNS service discovery. If the `-d` flag for domain is not available, you can specify a domain using the `routes` property in the manifest so other TAS for VMs apps can reach the pushed app at `APP-NAME.INTERNAL-DOMAIN`. This value defaults to `apps.internal`.
12. Activate the **Allow space developers to manage network policies** check box to permit developers to manage their own network policies for their apps.

13. Activate the **Log revision number in app logs** check box include app revision id as well in apps' log sources. (e.g. logs will have prefixes like APP/REV/1/PROC/WEB/0 instead of APP/PROC/WEB/0.). Once activated, apps will need to be restarted to take effect. Only applies to apps with the revision feature flag activated.

14. Click **Save**.

Setting appropriate ASGs is critical for a secure deployment.

1. Select **App Security Groups**.
2. Acknowledge **You are responsible for setting the appropriate ASGs after TAS for VMs finishes deploying**.
3. Click **Save**.

For more information about ASGs, see [App Security Groups](#).

For more information about setting ASGs, see [Restricting App Access to Internal TAS for VMs Components](#).

## Authentication and enterprise SSO

In the **Authentication and Enterprise SSO** pane, you configure your user store access.

To configure the **Authentication and Enterprise SSO** pane:

1. Select **Authentication and Enterprise SSO**.
2. To authenticate user sign-ons, your deployment can use one of three types of user database: the UAA server's internal user store, an external SAML identity provider, or an external LDAP server. To configure the user database that your deployment uses to authenticate users, select one of the following options under **User authentication mechanism**:
  - To use the internal UAA instance, select **Internal user store** and follow the procedure in [Configuring UAA password policy](#) to configure your password policy.
  - To connect to an external identity provider through SAML, select **SAML identity provider** and follow the procedure in [Configure TAS for VMs to use a SAML identity provider](#) in [Configuring Authentication and Enterprise SSO for TAS for VMs](#).
  - To connect to an external LDAP server, select **LDAP server** and follow the procedure in [Configure LDAP as an identity provider for TAS for VMs](#) in [Configuring Authentication and Enterprise SSO for TAS for VMs](#).
  - To use an external OIDC identity provider, select **OIDC identity provider** and follow the procedure in [Configure TAS for VMs to Use an OIDC identity provider](#).
3. Click **Save**.

## UAA

In the **UAA** pane, you configure the User Account and Authentication (UAA) server.

To configure the **UAA** pane:

1. Click **UAA**.

2. Under **UAA database location**, select one of these options:

- **Tanzu Application Service database:** Use the same database server that other TAS for VMs components use. This system database is configured in the **Databases** pane, and it can be either internal or external.
- **External database:** Use a separate, dedicated database server for UAA. For GCP installations, VMware recommends using an external database on Google Cloud SQL.



Protect whichever database you use in your deployment with a password.

3. (Optional) If you selected **External database**, complete these fields as follows.

- For **Hostname**, enter the hostname of the database server.
- For **TCP port**, enter the port of the database server.
  - **AWS Terraform:** Enter the value of `rds_port` in the Terraform output.
  - **GCP and GCP Terraform:** Enter `3306`.
- For **Username**, specify a unique user name that can access this database on the database server.
  - **AWS Terraform:** Enter the value of `rds_username` from your Terraform output.
  - **GCP Terraform:** Enter the value of `tas_sql_username` from your Terraform output.
- For **Password**, specify a password for the provided user name.
  - **AWS Terraform:** Enter the value of `rds_password` from your Terraform output.
  - **GCP Terraform:** Enter the value of `tas_sql_password` from your Terraform output.
- For **Username**, specify a unique user name that can access this specific database on the database server.
- For **Password**, specify a password for the provided username.
- For **CA certificate**, enter a certificate to use for encrypting traffic to and from the database.



The **CA certificate** text box only works if your external database host name matches a name specified in the certificate. This is not true with GCP CloudSQL.

4. (Optional) Under **JWT issuer URI**, enter the URI that UAA uses as the issuer when generating tokens.
5. Under **SAML service provider credentials**, enter a certificate and private key to be used by UAA as a SAML service provider for signing outgoing SAML authentication requests. You can provide an existing certificate and private key from your trusted Certificate Authority or generate a certificate. The domain `*.login.SYSTEM-DOMAIN` must be associated with the certificate, where `SYSTEM-DOMAIN` is the **System domain** you configured in the **Domains** pane.



The Operations Manager Single Sign-On Service and Operations Manager Spring Cloud Services tiles require the `*.login.SYSTEM-DOMAIN`.

6. Under **SAML service provider credentials**, enter a certificate and private key to be used by UAA as a SAML service provider for signing outgoing SAML authentication requests. You can provide an existing certificate and private key from your trusted Certificate Authority or generate a certificate. The domain `*.login.SYSTEM-DOMAIN` must be associated with the certificate, where `SYSTEM-DOMAIN` is the **System domain** you configured in the **Domains** pane.



The Operations Manager Single Sign-On Service and Operations Manager Spring Cloud Services tiles require the `*.login.SYSTEM-DOMAIN`.

7. If the private key specified under **SAML service provider credentials** is password-protected, enter the password under **Private key password**.
8. (Optional) To override the default value, enter a custom SAML Entity ID in the **SAML Entity ID override** text box. By default, the SAML Entity ID is `http://login.SYSTEM-DOMAIN`, where `SYSTEM-DOMAIN` is the **System domain** you configured in the **Domains** pane.
9. For **Signature algorithm**, choose an algorithm from the drop-down menu to use for signed requests and assertions. The default value is **SHA256**.
10. (Optional) In the **Apps Manager access token lifetime**, **Cloud Foundry CLI access token lifetime**, and **Cloud Foundry CLI refresh token lifetime** text boxes, change the lifetimes of tokens granted for Apps Manager and cf CLI login access and refresh. Most deployments use the defaults.
11. (Optional) In the **Global login session maximum timeout** and **Global login session idle timeout** text boxes, change the maximum number of seconds before a global login times out. These text boxes apply to:
  - **Default zone sessions:** Sessions in Apps Manager, Operations Manager Metrics, and other web UIs that use the UAA default zones.
  - **Identity zone sessions:** Sessions in apps that use a UAA identity zone, such as a Operations Manager Single Sign-On service plan.
12. (Optional) Customize the text prompts used for the user name and password from the cf CLI and Apps Manager login pop-up by entering values for **Username label** and **Password label**.
13. (Optional) The **Proxy IPs regular expression** field text box contains a pipe-separated set of regular expressions that UAA considers to be reverse proxy IP addresses. UAA respects the `x-forwarded-for` and `x-forwarded-proto` headers coming from IP addresses that match these regular expressions. To configure UAA to respond properly to Gorouter or HAProxy requests coming from a public IP address, append a regular expression or regular expressions to match the public IP address.
14. (Optional) Deselect the **Client basic auth compatibility mode** check box to require URL encoding for UAA client basic authentication credentials. By default, the check box is selected and URL encoding is not required. This represents the default behavior of UAA before UAA v74.0.0. URL encoding is defined by RFC6749. For more information, see [RFC6749](#). To require URL encoding for certain UAA clients without deactivating compatibility mode, use the `X-CF-ENCODED-CREDENTIALS=true` HTTP header.



If you deselect the **Client basic auth compatibility mode** check box, URL encoding is required for all UAA client apps in your deployment. To avoid breaking changes, ensure that all client apps support URL encoding before you deselect the check box.

15. (Optional) If you are using [Single Sign-On for VMware Tanzu Application Service](#) and you want to honor the CORS policy for custom identity zones, deselect the **Enforce system zone CORS policy across all identity zones** check box. This check box is selected by default. If you use Single Sign-On, UAA creates custom identity zones. If you leave this check box selected, UAA ignores the CORS policy for custom identity zones and applies the system default identity zone CORS policy to all zones.



If you deselect the **Enforce system zone CORS policy across all identity zones** check box, apps that are integrated with Single Sign-On might experience downtime because the default CORS policy of the custom identity zones is more restrictive. To prevent downtime, you must explicitly set the CORS policy of the custom identity zones according to the needs of your apps. For more information, see the [Managing Service Plan Configurations](#) in the Single Sign-On documentation.

16. (Optional) To override the default UAA internal user password policies, see [Configuring UAA password policy](#).
17. Click **Save**.

## CredHub

In the **CredHub** pane, you configure the CredHub server.

To configure the **CredHub** pane:

1. Select **CredHub**.
2. Under **CredHub database location**, select the location of your CredHub database. TAS for VMs includes this CredHub database for services to store their service instance credentials.
  - **TAS for VMs database**: If you select this option, CredHub uses the same database as other TAS for VMs components, whether the database is internal or external. You configure this database in the **Databases** pane.
  - **External database**: If you select this option, configure these fields:
    - **Hostname**: Enter the IP address of your database server.
    - **TCP port**: Enter the port of your database server, such as [3306](#).
    - **Username**: Enter a unique username to use to access your CredHub database on the database server.
    - **Password**: Enter the password for the provided username.
    - **CA certificate**: This certificate is used when encrypting traffic to and from the CredHub database. For certificate rotation, you may enter multiple CA certificates

in this field.

- **Skip hostname verification:** Select if you don't want CredHub to verify the identity of your database server during TLS connections. You cannot deactivate hostname verification for TLS connections to Postgres databases. You must select this option if you are configuring an external database on GCP or Azure.

If you deploy TAS for VMs on AWS using Terraform, you can locate these values in your Terraform output:

- **Hostname:** `rds_address`
- **TCP port:** `rds_port`
- **Username:** `rds_username`
- **Password:** `rds_password`

3. (Optional) Under **KMS providers**, specify one or more Key Management Service (KMS) providers:
  - **Name:** Enter the name of the KMS provider.
  - **Endpoint:** Enter the Unix socket address for the KMS plug-in.
  - **Primary:** Activate the **Primary** check box to indicate the primary KMS provider for your environment. You must mark one provider as primary. Do not mark more than one provider as primary.
4. Under **Internal encryption provider keys**, specify one or more keys to use for encrypting and decrypting the values stored in the CredHub database.
  - If you plan to use internal encryption, configure these fields:
    - **Name:** Enter any key name.
    - **Key:** Enter a randomly generated value that is at least 20 characters long. This key is used for encrypting all data.
    - **Primary:** This check box marks the key you specified as the primary encryption key. You must mark one key as primary. Do not mark more than one key as primary.
  - If you plan to use a hardware security module (HSM) as your encryption provider, configure these fields:
    - **Name:** Enter a key name that already exists on your HSM or a new key name. For each new key name, CredHub generates a key in **HSM provider partition** that you configure.
    - **Key:** Enter a placeholder value under **Key**. CredHub does not use this key for encryption. However, you cannot leave the **Key** field blank.
    - **Primary:** This check box is used for marking the key you specified as the primary encryption key. You must mark one key as primary. Do not mark more than one key as primary.

For information about using additional keys for key rotation, see [Rotating Runtime CredHub Encryption Keys](#).

5. (Optional) To configure CredHub to use an HSM, configure these fields:

- **HSM provider partition:** Enter the name of the HSM provider partition.
  - **HSM provider partition password:** Enter a password to use to access the HSM provider partition.
  - **HSM provider client certificate:** Enter the client certificate for the HSM. For more information, see [Create and Register HSM Clients](#) in *Preparing CredHub HSMs for Configuration*.
  - Under **HSM provider encryption keys**, specify one or more keys to use for encrypting and decrypting the values stored in the HSM provider. For each key, configure these fields:
    - **Name:** Enter the name of the encryption key.
    - **Primary:** This check box is used for marking the key you specified as the primary encryption key. You must mark one key as primary. Do not mark more than one key as primary.
  - In the **HSM provider servers** section, click **Add** to add an HSM server. You can add multiple HSM servers. For each HSM server, configure these fields:
    - **Host address:** Enter the hostname or IP address of the HSM server.
    - **Port:** Enter the port of the HSM server. If you do not know your port address, enter [1792](#).
    - **Partition serial number:** Enter the serial number of the HSM partition.
    - **HSM certificate:** Enter the certificate for the HSM server. The HSM presents this certificate to CredHub to establish a two-way TLS connection.
6. If your deployment uses any Operations Manager services that support storing service instance credentials in CredHub and you want to activate this feature, activate the **Secure service instance credentials** check box. For more information about using CredHub for securing service instance credentials, see [Securing Service Instance Credentials with Runtime CredHub](#).
  7. Click **Save**.
  8. Go to the **Resource Config** pane.
  9. Under the **Job** column of the **CredHub** row, ensure that the number of instances is set to [2](#). This is the minimum instance count required for high availability.
  10. To configure CredHub so it detects a proxy, complete the following fields:
    - **Proxy servers:** Enter a comma-separated list of router IP addresses for the first group of HTTP/TCP backends.
    - **HTTP proxy URL:** Enter the [http\\_proxy](#) for all HTTP requests across VMs.
    - **HTTPS proxy URL:** Enter the [https\\_proxy](#) for all HTTPS requests across VMs
    - **Excluded hosts:** Enter a comma-separated list of domains, IP addresses, or DNS suffixes to exclude from proxying.
  11. Click **Save**.

## Databases

In the **Databases** pane, you can configure TAS for VMs to use an internal MySQL database provided with Operations Manager, or you can configure an external database provider for the databases required by TAS for VMs.

If you are performing an upgrade, do not modify your existing internal database configuration, or you might lose data. You must migrate your existing data first before changing the configuration. For additional upgrade information, see [Upgrading Operations Manager](#). ## Internal system database configuration

For GCP installations, VMware recommends selecting **External** and using Google Cloud SQL. Only use internal MySQL for non-production or test installations on GCP.

To configure internal databases for your deployment:

1. Under **System databases location**, select **Internal MySQL clusters**.
2. Click **Save**.

To configure high availability for your internal MySQL databases, see [Configure Internal MySQL](#).

## External system database configuration

To configure external databases for your deployment:

1. Ensure that you have a database instance with the following databases created:
  - account
  - app\_usage\_service
  - autoscale
  - ccdb
  - credhub
  - diego
  - locket
  - networkpolicyserver
  - nfsvolume
  - notifications
  - routing
  - silk
  - uaa



The steps to create external databases vary depending on your database type. For an example procedure, see [Creating databases for TAS for VMs](#).

2. In the TAS for VMs tile, select **Databases**.
3. Under **System databases location**, select **External database server**.



If you configure external databases, you cannot configure an internal database in the **UAA** pane.

4. For **Hostname**, enter the hostname of your external database server.
5. The **Require hostname validation** check box is selected by default. When this check box is selected and you configure your external databases to communicate over TLS, TAS for VMs verifies the hostname of the external database during communication between TAS for VMs and the external database.



If your deployment uses a GCP or Azure external database for TAS for VMs that is configured to use TLS, you must deselect the **Require hostname validation** check box. For more information, see [Deactivate Hostname Validation for External Databases on GCP and Azure](#) in *Upgrade Preparation Checklist for Tanzu Operations Manager v2.10*.



The **Require hostname validation** check box does not affect communication between TAS for VMs components and external CredHub databases. To configure hostname validation for the CredHub external database, see [Configure CredHub](#).

6. For **TCP port**, enter the port of your external database server. If you are using GCP CloudSQL as your external database server, enter **3306**.
7. Each component that requires a relational database has two corresponding fields: one for the database user name, and one for the database password. For each set of fields, specify a unique user name that can access this specific database on the database server and a password for the provided user name.



- Ensure that the `networkpolicyserver` database user has the **ALL PRIVILEGES** permission.
- If CredHub uses the same database as other TAS for VMs components, you must configure the **CredHub database username** and **CredHub database password** fields.
- If UAA uses the same database as other TAS for VMs components, you must configure the **UAA database username** and **UAA database password** fields.
- If you are configuring an external database on GCP or Azure and want to use this database for CredHub, do not configure the **CredHub database username** and **CredHub database password** fields. Instead, you must enter these credentials in the **CredHub** pane of the TAS for VMs tile.

8. (Optional) To configure your external databases to communicate over TLS, enter a CA certificate in **CA certificate**.



TAS for VMs does not support TLS communication for databases that do not include a matching hostname in their server certificate, such as Azure and GCP, unless you deselect the **Require hostname validation** check box and select the **Skip hostname verification** check box in the **CredHub** pane of the TAS for VMs tile. For more information, see the [GCP documentation](#). To configure the **Skip hostname verification** check box, see [Configure CredHub](#).

- Click **Save**.

## File storage



### Important

Some blobstores, for example, Oracle Cloud Infrastructure Object Storage, do not support S3 Signature v4 Streaming. To use blobstores without S3 Signature v4 Streaming support with VMware Tanzu Application Service for VMs, deselect the Signature v4 streaming check box.

For more information, see [AWS-S3 Signature v4 Streaming](#).

In **File Storage**, you determine where you want to place the file storage for your Cloud Controller.

To configure the **File Storage** pane:

- Select **File Storage**.
- For **Maximum valid packages per app**, enter the maximum number of recent valid packages that your app can store, not including the package for the current droplet. VMware recommends using the default value of [2](#). However, you can lower the value if you have strict storage requirements and want to use less disk space.
- For **Maximum staged droplets per app**, enter the maximum number of recent valid droplets that your app can store, not including the package for the current droplet. VMware recommends using the default value of [2](#). However, you can lower the value if you have strict storage requirements and want to use less disk space.
- Under **File storage backup level**, select what you want to back up from your blobstores:
  - Complete file storage backup:** Includes the entire blobstore. This includes droplets, packages, and buildpacks.
  - Exclude droplets from file storage backup:** Excludes droplets from your backup. If you select this option, you must re-stage all apps during a restore.
  - Exclude droplets and packages from file storage backup:** Excludes droplets and packages from your backup. If you select this option, you must re-push all apps during a restore.

For more information about the advantages and disadvantages of excluding droplets and packages, see [File storage backup level](#).

- To configure **Cloud Controller filesystem**, see [Configuring file storage for TAS for VMs](#).

# Cloud Controller

In the **Cloud Controller** pane, you configure the Cloud Controller.

To configure the **Cloud Controller** pane:

1. Click **Cloud Controller**.
2. Enter your **Cloud Controller database encryption key** if all of the following are true:
  - You deployed TAS for VMs previously.
  - You then stopped TAS for VMs or it ended.
  - You are redeploying TAS for VMs with a backup of your Cloud Controller database.

For more information, see [Backing up and restoring Operations Manager](#).
3. Cloud Foundry API rate limiting prevents API consumers from overwhelming the platform API servers. Limits are imposed on a per-user or per-client basis and reset on an hourly interval. Under **Cloud Foundry API rate limiting**, select one of the following options:
  - To configure Cloud Foundry API rate limiting:
    1. For **General limit**, enter the number of requests a user or client is to be allowed to make over an hour-long interval for all endpoints that do not have a custom limit. The default value is `2000`.
    2. For **Unauthenticated limit**, enter the number of requests an unauthenticated client is to be allowed to make over an hour-long interval. The default value is `100`.
  - To disallow Cloud Foundry API rate limiting, select **Do not use**.
4. (Optional) For **Database connection validation timeout**, enter in seconds the database connection validation timeout period you want to configure. The default value is `3600`. To configure Cloud Controller to make an additional query to the database whenever connections are checked out from the pool, enter `-1`. Configuring `-1` in this field has performance implications.
5. (Optional) For **Database read timeout**, enter in seconds the database read timeout period you want to configure. The default value is `3600`.
6. (Optional) For **Cloud Controller monit health check timeout**, enter in seconds the amount of time to wait before an HTTP request from the Cloud Controller monit health check is closed. The default value is `6`.
7. (Optional) For **Age of audit events pruned from Cloud Controller database**, enter in days the age at which audit events are to be pruned from the Cloud Controller database. The default value is `31`.
8. (Optional) For **Age of completed tasks pruned from Cloud Controller database**, enter in days the age at which completed tasks are to be pruned from the Cloud Controller database. The default value is `31`.
9. (Optional) Rotate the Cloud Controller database (CCDB) encryption key using the **Encryption key ledger** field. For more information, see [Rotating the Cloud Controller database encryption key](#).

10. For **Available Stacks**, configure the set of stacks you want to make available to app developers on the platform:
  1. Select the stacks to expose to developers. `cflinuxfs4` is the latest stack, based on Ubuntu Jammy Jellyfish (22.04), and is recommended. `cflinuxfs3`, an older stack based on Ubuntu Bionic Beaver (18.04), remains supported as well. Lastly, `tanzu-jammy` refers to the Tanzu [Jammy Full stack](#). This stack uses the same operating system as `cflinuxfs4`, but is based on the Paketo stacks. Operators have the following four configuration options:
    - `cflinuxfs4` only
    - `cflinuxfs3` and `cflinuxfs4`
    - `cflinuxfs4` and `tanzu-jammy`
    - `cflinuxfs3`, `cflinuxfs4`, and `tanzu-jammy`
  2. Select a **Default stack**. This stack is used whenever an app is pushed with no stack specified. The available options are `cflinuxfs3` and `cflinuxfs4`. `tanzu-jammy` is not supported as a default stack. If you select a stack list that does not include `cflinuxfs3`, then `cflinuxfs4` is used as the default stack.
11. (Optional) **Number of local workers per Cloud Controller VM**. Defaults to 2. See [Scaling Local Workers](#) for more information.
12. (Optional) **Enable Prometheus metrics for Cloud Controller**. Defaults to disabled. For more information, see [Cloud Controller metrics](#).
13. (Optional) **Enable StatsD metrics for Cloud Controller**. Defaults to enabled. For more information, see [Cloud Controller metrics](#).
14. (Optional) **Enable Cloud Controller web server to utilize multiple CPU cores and automatically set the number of Puma workers**. This allows the Cloud controller API VMs to utilize multiple CPU cores and lets Puma automatically set the number of workers based on the number of available cores. This uses the Ruby Puma web server instead of Thin. This feature uses a different format for primary metrics (Prometheus). For more information on these properties see [Scaling Puma Web Server](#) and more information on migration see [Cloud Controller Multi-Process Mode \(Puma\)](#).
  1. Select the number of Puma Workers. This is the number of child process to run as part of Puma clustered mode. This should not exceed the number of CPU cores available to the Cloud Controller API VM. The number of CPU cores can be found on the **Resource Config** page in the Ops Manager UI.
  2. Maximum number of threads per Puma Workers. For Cloud Controller running Puma to be able to handle as many concurrent requests as an API server running Thin, it's recommended that Number of Workers x Number of Threads is greater or equal to 20. Default threads is `10`.
  3. Maximum database connections per Puma Worker. The total number of connections is equal to Number of Workers x Maximum database connections per Worker. Be aware that incorrectly setting this may lead to too many connections for your Database. See [Scaling Puma Web Server](#) for more information.



To reduce the number of Cloud Controller API VMs, use Multi-Process Mode as described in [Cloud Controller Multi-Process Mode](#) or increase the number of local workers per Cloud Controller VM as described in [cloud\\_controller\\_worker\\_local](#).

15. Click **Save**.

## Smoke tests

In the **Smoke Tests** pane, you configure where smoke tests are run. In this location, the Smoke Tests errand pushes an app to a Operations Manager org to run basic function tests against the TAS for VMs tile after an installation or update. In the **Errands** pane, you can choose whether or not to run the Smoke Tests errand.

To configure the **Smoke Tests** pane:

1. Select **Smoke Tests**.
2. In the **Smoke tests location**, select one of the following options to configure where TAS for VMs pushes an app to run smoke tests:
  - If you have a shared apps domain, select **A temporary space within the system org**. This creates a temporary space within the `system` org for running smoke tests and deletes the space afterwards.
  - If you do not have a shared apps domain:
    1. Select **A specified domain, org, and space**.
    2. For **Domain**, enter the domain that TAS for VMs uses when pushing an app to run smoke tests.
    3. For **Org**, enter the org that TAS for VMs uses when pushing an app to run smoke tests.
    4. For **Space**, enter the space that TAS for VMs uses when pushing an app to run smoke tests.
3. Click **Save**.

## Errands

Errands are scripts that Tanzu Operations Manager runs automatically when it installs or uninstalls a product, such as a new version of TAS for VMs. There are two types of errands: *post-deploy errands* run after the product is installed, and *pre-delete errands* run before the product is uninstalled.

By default, Tanzu Operations Manager always runs all errands.

In the **Errands** pane, you can change these run rules. For each errand, you can select **On** to run it always or **Off** to never run it.

For more information about how Tanzu Operations Manager manages errands, see [Managing Errands in Tanzu Operations Manager](#).



Several errands, such as **App Autoscaler** and **Notifications**, deploy apps that provide services for your deployment. When one of these apps is running, selecting **Off** for the

corresponding errand on a subsequent installation does not stop the app.

- The **Smoke Test Errand** verifies that your deployment can do the following:
  - Push, scale, and delete apps
  - Create and delete orgs and spaces
- The **Usage Service Errand** deploys the Usage Service app on which Apps Manager depends.
- The **Offline Docs Errand** deploys an offline documentation app that can be used in air-gapped environments.
- The **Apps Manager Errand** deploys Apps Manager, a dashboard for managing apps, services, orgs, users, and spaces. Until you deploy Apps Manager, you must perform these functions through the cf CLI. After you first deploy Apps Manager, VMware recommends setting this errand to **Off** for subsequent TAS for VMs deployments. For more information about Apps Manager, see [Getting started with apps Manager](#).
- The **Notifications Errand** deploys an API for sending email notifications to your TAS for VMs platform users.



The Notifications app requires you to configure a user name and password for your SMTP server, even if you select **None** from the **SMTP authentication mechanism** drop-down menu in the **Email Notifications** pane of the TAS for VMs tile. To configure a user name and password for your SMTP server, see [Configure email notifications](#).

- The **Notifications UI Errand** deploys a dashboard through which users can manage their notification subscriptions.
- The **App Autoscaler Errand** pushes the App Autoscaler app, which allows you to configure your apps to automatically scale in response to changes in their load. For more information, see [Scaling an App Using App Autoscaler](#).
- The **App Autoscaler Smoke Test Errand** runs smoke tests against App Autoscaler.
- The **NFS Broker Errand** pushes the NFS Broker app, which supports NFS volume services for TAS for VMs. For more information, see [Enable NFS Volume Services in Enabling Volume Services](#).
- The **Metric Registrar Smoke Test Errand** verifies that the Metric Registrar can access custom metrics that an app emits and convert them into Loggregator metrics.



The **Metric Registrar Smoke Test** errand runs only if the Metric Registrar is deployed. For more information about configuring the Metric Registrar, see [Metric Registrar and Custom App Metrics](#).

- The **SMB Broker Application Errand** pushes the SMB Broker app, which supports SMB volume services for TAS for VMs. For more information, see [Enable SMB volume services in Enabling Volume Services](#).

- The **Rotate CC Database Key** translates sensitive data in the Cloud Controller database to the key that is marked as **Primary** in the **Cloud Controller** pane of the TAS for VMs tile. You configure this key in the **Encryption key ledger** field of the **Cloud Controller** pane.

## Resources

In the **Resource Config** pane, you must associate load balancers with the VMs in your deployment to activate traffic. For more information, see [Configure Load Balancing for TAS for VMs](#).

## Scale down and deactivate resources (Optional)



The **Resource Config** pane has fewer VMs if you are installing Small Footprint TAS for VMs. For more information, see [Differences in Small Footprint TAS for VMs](#).



Small Footprint TAS for VMs does not default to a highly available configuration. It defaults to the minimum configuration. To make Small Footprint TAS for VMs highly available, scale the **Compute**, **Router**, and **Database** VMs to 3 instances and scale the **Control** VM to 2 instances.

TAS for VMs defaults to a highly available resource configuration. However, you might need to follow additional procedures to make your deployment highly available. For more information, see [High availability in TAS for VMs](#) and [Scaling TAS for VMs](#).

If you do not want a highly available resource configuration, you must scale down your instances manually by navigating to the **Resource Config** section and using the drop-down menus under **Instances** for each job.

By default, TAS for VMs also uses an internal filestore and internal databases. If you configure TAS for VMs to use external resources, you can deactivate the corresponding system provided resources in Tanzu Operations Manager to reduce costs and administrative overhead.

To deactivate specific VMs in Tanzu Operations Manager:

1. Select **Resource Config**.
2. **File Storage:** If you configured TAS for VMs to use an external S3-compatible filestore, enter 0 in **Instances** in the **File Storage** field.
3. **External Databases:** If you selected **External** when configuring the UAA, System, and CredHub databases, edit these fields:
  - **MySQL Proxy:** Enter 0 in **Instances**.
  - **MySQL Server:** Enter 0 in **Instances**.
  - **MySQL Monitor:** Enter 0 in **Instances**.
4. **TCP Routing:** If you deactivated TCP routing, enter 0 **Instances** in the **TCP Router** field.
5. **Logging and Metrics:** You can scale down logging and metrics infrastructure that uses either legacy Loggregator architecture or the newer Shared Nothing architecture:

- If you are confident that you are not using the V1 or V2 firehoses, you can scale the **Doppler Server** and **Loggregator Trafficcontroller** instance groups to zero.



Before scaling dopplers and traffic controllers to zero instances, you must validate that none of the products deployed alongside TAS for VMs are using the V1 or V2 Firehoses. You should also deselect the **Enable V1 Firehose** and **Enable V2 Firehose** fields in the **System Logging** pane. The **Deploy Metric Registrar** field must also be deselected because Metric Registrar relies on the firehose. For more information about configuring these fields, see [System Logging](#).

- If you are still reliant on the Firehose for egressing metrics (but have moved to syslog for egressing application logs) you can select the **Do not forward app logs to the Firehose** option in the **System Logging** pane to reduce the required footprint of your dopplers and traffic controllers.

6. Click **Save**.

## Stemcell

This step is only required if your Tanzu Operations Manager deployment does not already have the stemcell version that TAS for VMs requires. For more information about importing stemcells, see [Importing and managing Stemcells](#).

To download the stemcell version TAS for VMs requires:

1. Go to the [Stemcell product page](#) on Broadcom Support. You might need to log in.
2. Download the appropriate stemcell version for your IaaS.
3. Go to the Tanzu Operations Manager Installation Dashboard.
4. Click **Stemcell Library**.
5. Click **Import Stemcell** to import the stemcell `.tgz` file that you downloaded in a previous step.
6. When you are prompted, stage your stemcell by selecting the Tanzu Operations Manager product check box.
7. Click **Apply Stemcell to Products**.

## Complete the TAS for VMs Installation

To complete your installation of TAS for VMs:

1. Click the **Installation Dashboard** link to return to the Tanzu Operations Manager Installation Dashboard.
2. Click **Review Pending Changes**, then **Apply Changes**. The installation process generally takes a minimum of 90 minutes to complete. The Changes Applied window is shown when the installation process completes successfully. Click **Close** or **Return to Installation Dashboard**.

## ➊ Changes Applied

✖

Your changes were successfully applied.

*We recommend that you export a backup of this installation from the actions menu.*

**CLOSE****RETURN TO DASHBOARD**

## Configure optional features

In this section:

- [Internal MySQL](#)
- [System logging](#)
- [Custom branding and Apps Manager](#)
- [Email notifications](#)
- [App Autoscaler](#)
- [Advanced features](#)
- [Metric Registrar](#)

## Configure Internal MySQL

In the **Internal MySQL** pane, you configure the internal MySQL clusters for TAS for VMs. Only configure this section if you selected **Internal MySQL clusters** in the **Databases** pane.

To configure the **Internal MySQL** pane:

1. Select **Internal MySQL**.
2. For **Replication canary time period**, enter in seconds how frequently the canary checks for replication failure. The default value is **30**. Leave the default of 30 seconds or modify the value based on the needs of your deployment. Lower numbers cause the canary to run more frequently, which means that the canary reacts more quickly to replication failure but adds load to the database.
3. For **Replication canary read delay**, enter in seconds how long the canary waits before verifying that data is replicating across each MySQL node. The default value is **20**. Leave the default of 20 seconds or modify the value based on the needs of your deployment. Clusters under heavy load can experience a small replication lag as write-sets are committed across the nodes.
4. For **Email address**, enter the email address to which the MySQL service sends alerts when the cluster experiences a replication issue or when a node is not allowed to auto-rejoin the cluster.
5. The **Allow command history** check box is selected by default. When this check box is selected, command line history files can be created on MySQL nodes. To prohibit command line history files from being created on the MySQL nodes, deselect this check box.
6. To allow admin and read-only admin users to connect from any remote host, select the **Allow remote admin access** check box. When this check box is deselected, admins must **bosh ssh** into

each MySQL VM to connect as the MySQL super user.

Network configuration and ASG restrictions might still limit a client's ability to establish a connection with the databases.

7. For **Cluster probe timeout**, enter in seconds the maximum amount of time that a new node searches for existing cluster nodes. The default value is `10`.
8. For **Maximum connections**, enter the maximum number of concurrent connections allowed to the database. The default value is `3500`.
9. Under **Server activity logging**, select one of the following options:
  - To configure the MySQL service to log audit events:
  - Select **Allow**.
    1. For **Event types**, you can enter the events you want the MySQL service to log. By default, this field includes the following event types:
    2. `connect`: Tracks who connects to the system.
    3. `query`: Tracks which queries are processed.

For more information about which events the Percona MySQL server can log, see the [Percona documentation](#).



Internal MySQL audit logs are not forwarded to the syslog server because they can contain personally identifying information (PII) and secrets. You can use the `download-logs` script to retrieve the logs, which each MySQL cluster node VM stores in `/var/vcap/store/mysql_audit_logs/`. For more information, see [Script to download MySQL logs for TAS for VMs or Tile HA Clusters](#) in the Broadcom Support Knowledge Base.

- To prevent the MySQL service from logging audit events, select **Do not allow**.
10. For **Load balancer healthy threshold**, enter in seconds the amount of time to wait until reporting that the MySQL Proxy instance has started. This allows an external load balancer time to register the instance as healthy. The default value is `0`.
  11. For **Load balancer unhealthy threshold**, enter in seconds the amount of time that the MySQL Proxy continues to accept connections before shutting down. During this period, the health check reports the MySQL Proxy instance as unhealthy to cause load balancers to fail over to other proxies. You must enter a value greater than or equal to the maximum time it takes your load balancer to consider a proxy instance unhealthy, given repeated failed health checks. The default value is `30`.
  12. To allow MySQL Proxy to listen on port `3336`, select the **Connect to inactive MySQL node** check box. When you run MySQL in HA mode, this feature allows you to connect to a MySQL node that is not serving traffic, so that you can run auditing and reporting queries without affecting performance.
  13. To configure MySQL Interruptor to prevent MySQL nodes with inconsistent data from writing to the MySQL database, select the **Prevent node auto re-join** check box.
  14. Click **Save**.

For more information about how to monitor the node health of your MySQL Proxy instances, see [Using the MySQL Proxy](#).

## Script to download MySQL logs for TAS for VMs or Tile HA Clusters

When using MySQL High Availability (HA) clusters (Galera) in TAS for VMs, and in the tile, there are many different logs that are useful when investigating customer issues. The `download-logs` script is useful for gathering the complete set of logs for TAS for VMs or MySQL tile HA (Galera) clusters.

1. Get the latest `download-logs` tool from the MySQL tile downloads on [Tanzu Network](#).
2. Confirm that the `download-logs` script is executable. Then run `download-logs` with no arguments to see the help text:

```
$ chmod +x download-logs
$ ./download-logs
BOSH_DEPLOYMENT, BOSH_ENVIRONMENT, BOSH_CLIENT_SECRET, BOSH_CLIENT, and BOSH_CA_CERT are required environment variables
Usage:
  -o (Required) The output directory
  -X (Optional) Include audit and binary logs

  This tool requires the bosh v2 cli and the following environment variables to be set:
  BOSH_ENVIRONMENT
  BOSH_CLIENT_SECRET
  BOSH_CLIENT
  BOSH_CA_CERT
  BOSH_DEPLOYMENT

  Optionally if you require communicating with your BOSH director through a gateway, you must set:
  BOSH_GW_PRIVATE_KEY
  BOSH_GW_USER
  BOSH_GW_HOST
```

3. Get the environment variable information from the Director credentials under **BOSH Commandline Credentials**.



These will be at `https://OPS-MANAGERFQDN/api/v0/deployed/director/credentials/bosh_commandline_credentials`.

4. Get the deployment name using the command, '

```
bosh deployments --column=name'
```

5. Set the variables for the BOSH CLI and the deployment. For example, when running 'download-logs' for this TAS deployment, the output would look like the example below:

```
$ export BOSH_CLIENT=ops_manager BOSH_CLIENT_SECRET=<secret> BOSH_CA_CERT=/var/tempest/workspaces/default/root_ca_certificate BOSH_ENVIRONMENT=<bosh_director_
```

```
ip>
$ export BOSH_DEPLOYMENT=<deployment_name>
```

- Run [download-logs](#) (on the Director VM). For example:

```
$ ./download-logs -o /tmp -X
Retrieving deployment and vm info...
Downloading deployment logs...
Using environment '10.193.78.11' as user 'admin' (bosh.*.read, openid, bosh.*.admin, bosh.read, bosh.admin)
Using deployment 'service-instance_ab436820-4d83-4ee6-b0f8-6606e749e405'

Task 71673 | 20:20:00 | Fetching logs for mysql/9abc28fa-fc09-4e32-9a25-3b6c979e4614 (0): Finding and packing log files (00:00:03)
Task 71673 | 20:20:01 | Fetching logs for mysql/c0bace44-6fb0-489b-b101-bf8de085766c (1): Finding and packing log files (00:00:04)
Task 71673 | 20:20:02 | Fetching group of logs: Packing log files together

Task 71673 Started Wed Jun 12 20:19:57 UTC 2019
Task 71673 Finished Wed Jun 12 20:20:02 UTC 2019
Task 71673 Duration 00:00:05
Task 71673 done

Downloading resource 'aca9b560-0618-4b9a-b127-aa3ec3cc9cce' to '/tmp/tmp.vj0qu015YS/service-instance_ab436820-4d83-4ee6-b0f8-6606e749e405-20190612-202004-901615727.tgz'...
0.00%
Succeeded

Downloading logs for: mysql/9abc28fa-fc09-4e32-9a25-3b6c979e4614
Downloading logs for: mysql/c0bace44-6fb0-489b-b101-bf8de085766c
Specify a passphrase of 6-8 words long. Do not use a private passphrase, you will need to share this passphrase with anyone who will decrypt this archive.
gpg: gpg-agent is not available in this session
Encrypted logs saved at /tmp/2019-06-12-20-19-54-mysql-logs.tar.gz.gpg
```

- Using the script, move the resulting file 'FILENAME.tar.gz.gpg' to some location with access to the Pivotal or VMware support portal, upload it to the support request (SR), and provide support with the passphrase used.
- (Optional) If you wish to extract the archive, you can use the following commands:

```
$ sudo gpg -d /tmp/FILENAME.tar.gz.gpg > /tmp/mysql-logs.tar.gz
$ sudo tar -zxvf /tmp/mysql-logs.tar.gz
```

## System logging

In the **System Logging** pane, you can configure system logging in TAS for VMs to forward log messages from TAS for VMs component VMs to an external service. VMware recommends forwarding logs to an external service for use in troubleshooting. If you do not fill these fields, platform logs are not forwarded but remain available on the component VMs and for download through Tanzu Operations Manager.



This procedure explains how to configure system logging for TAS for VMs component VMs. To forward logs from Operations Manager tiles to an external service, you must also configure system logging in each tile. For more information about configuring system logging, see the documentation for the given tiles.

To configure the **System Logging** pane:

1. Select **System Logging**.
2. For **Syslog server address**, enter the hostname or IP address of the syslog server.
3. For **Syslog server port**, enter the port of the syslog server. The default port for a syslog server is [514](#).



The host must be reachable from the TAS for VMs network and accept UDP or TCP connections. Ensure that the syslog server listens on external interfaces.

4. For **Transport protocol**, select a transport protocol for log forwarding.
5. (Optional) For **Environment identifier**, enter a custom label (e.g. the name of your foundation) to include in the structured data of forwarded syslog messages with the parameter name [environment](#).
6. For **TLS encryption**, select one of the following options:
  - **Use:** Configures TAS for VMs to use TLS encryption when forwarding logs to a remote server. If you select this option, configure the following fields:
    1. For **Permitted peer**, enter either the name or SHA1 fingerprint of the remote peer.
    2. For **CA certificate**, enter the CA certificate for the remote server.
  - **Do not use:** TAS for VMs does not use TLS encryption when forwarding logs to a remote server.
    1. VMware recommends enabling **mTLS encryption** at the earliest convenience for enhanced security, compliance, and protection against unauthorized access.



Only enable **mTLS encryption** when upgrading from TAS 5 or later. For upgrades from TAS <5 to TAS ≥5, leave this selector unchecked to avoid Log Cache downtime during the upgrade process.

7. (Optional) To include security events in the log stream, select the **Log Cloud Controller security events** check box. When this check box is selected, TAS for VMs logs all API requests in the Common Event Format (CEF), including the endpoint, user, source IP address, and request result.
8. (Optional) To transmit logs over TCP, select the **Use TCP for file forwarding local transport** check box. This prevents log truncation, but might cause performance issues.
9. The **Do not forward debug logs** check box is selected by default. To forward [DEBUG](#) syslog messages to an external service, deselect the check box.



Some TAS for VMs components generate a high volume of `DEBUG` syslog messages. Selecting the **Do not forward debug logs** check box prevents TAS for VMs components from forwarding the `DEBUG` syslog messages to external services. However, TAS for VMs still writes the messages to the local disk.

10. For **Custom syslog configuration**, enter a custom syslog rule. For more information about adding custom syslog rules, see [Customizing platform log forwarding](#).
11. Configure how TAS for VMs emits app logs and app metrics for ingestion in your deployment. The options include:
  - Use existing Firehose integrations for app metric and app log ingestion.
  - Preserve existing Firehose integrations for app metrics, but use an alternate method for app log ingestion.
  - Deactivate all Firehose integrations and use alternate methods for both app log and app metric ingestion.

The following table provides the configuration procedures for each option. For more information about each field, see the [Field Descriptions](#) table.

Option	Configuration Procedure
<b>Use existing Firehose app log and metrics integrations</b>	<ol style="list-style-type: none"> <li>1. Activate <b>Enable V1 Firehose</b>.</li> <li>2. Activate <b>Enable V2 Firehose</b>.</li> <li>3. Deactivate <b>Do not forward app logs to the Firehose</b>.</li> <li>4. (Optional) Configure <b>Aggregate syslog drain destinations</b>.</li> </ol>
<b>Preserve existing Firehose integrations for app metrics, but use an alternate method for app log ingestion</b>	<div style="display: flex; align-items: center;"> <span style="color: yellow;"></span> <div style="margin-left: 10px;"> <p>Do not use this option if your deployment depends on partner log integrations.</p> <ol style="list-style-type: none"> <li>1. Activate <b>Enable V1 Firehose</b>.</li> <li>2. Activate <b>Enable V2 Firehose</b>.</li> <li>3. Activate <b>Do not forward app logs to the Firehose</b>.</li> <li>4. Configure <b>Aggregate syslog drain destinations</b>.</li> </ol> </div> </div>

Option	Configuration Procedure
<b>Deactivate all Firehose integrations and use alternate methods for both app log and app metric ingestion</b>	<p> Do not use this option if your deployment depends on any of these:</p> <ul style="list-style-type: none"> <li>◦ Service tile metrics</li> <li>◦ Healthwatch or App Metrics</li> <li>◦ Metric Registrar</li> <li>◦ Partner log or metric integrations</li> </ul>

1. Deactivate **Enable V1 Firehose**.
2. Deactivate **Enable V2 Firehose**.
3. Deactivate **Do not forward app logs to the Firehose**.
4. Configure **Aggregate syslog drain destinations**.
5. Scale the **Doppler Server** and **Loggregator Trafficcontroller** instance groups to zero in the **Resource Config** pane. See [Resources](#) for more information.

### Field Descriptions:

The following table provides more details on field values:

Field Name	Description
<b>Enable V1 Firehose</b>	Selected by default. When this check box is selected, logs and metrics flow to the Loggregator V1 Firehose.
<b>Enable V2 Firehose</b>	Selected by default. When this check box is selected, logs and metrics flow to the Loggregator V2 Firehose.
<b>Send default Loggregator drain metadata</b>	Selected by default. When this check box is selected, TAS for VMs sends all metadata in app and aggregate syslog drains. Deselect this check box can reduce logging to external databases by up to 50 percent.
<b>Do not forward app logs to the Firehose</b>	Deselected by default. When this check box is selected, TAS for VMs prevents the Firehose from emitting app logs, but still allows the Firehose to emit app metrics. Deactivating logs in Firehose helps reduce the load on TAS for VMs by allowing you to scale down Doppler and Traffic Controller VMs.

Field Name	Description
<b>Aggregate syslog drain destinations</b>	<p>Specify zero or more aggregate syslog drains. Aggregate syslog drains forward all app logs on your foundation to the endpoints that you provide in this field:</p> <ul style="list-style-type: none"> <li>○ <b>Syslog Drain URL:</b> Enter the endpoint in the format: <code>syslog://HOSTNAME:PORT</code>. To use TLS for sending logs, specify <code>syslog-tls://HOSTNAME:PORT</code>.</li> <li>○ <b>Certificate Authority:</b> (Optional) Enter the Certificate Authority (CA) certificate to trust for the endpoint.</li> <li>○ <b>Client Certificate:</b> (Optional) Enter the client certificate and private key to be used for mTLS communication with the endpoint.</li> </ul> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;">  In earlier versions of TAS for VMs multiple aggregate syslog drains were entered by using a comma-separated list. This is no longer supported and endpoints should be added individually.       </div>

12. (Optional) For **System metrics scrape interval**, the default value is `1m`, which configures TAS for VMs to send BOSH system metrics to your logging endpoint once per minute. To configure TAS for VMs to send metrics more or less frequently, modify the value in this field. For example, enter `2m` to send metrics every two minutes, or `10s` to send metrics every ten seconds. VMware recommends configuring a minimum interval of five seconds, or `5s`.
13. (Optional) For **OpenTelemetry Collector Configuration**, the default value is empty, which deactivates the OpenTelemetry Collector.
  - To configure TAS for VMs to send logs, metrics, and traces using the OpenTelemetry Collector, enter valid OpenTelemetry Collector YAML configuration in this text box. See [Configuring the OpenTelemetry Collector](#) for examples of how to configure OpenTelemetry Collector. Currently TAS for VMs supports a limited number of OpenTelemetry Collector Exporters and Processors.
  - To use non-GA exporters and processors from the available options, you must enable experimental features by selecting the **Experimental OpenTelemetry Collector features** checkbox.

 The OpenTelemetry Collector is supported in TAS for VMs v6.0.13 and later.

 If you configure an exporter that listens on a port, ensure that the port is not claimed by a TAS for VMs component on any of the VMs in your deployment.

14. Click **Save**.

To configure Tanzu Operations Manager for system logging, see [Settings page](#) in [Using the Tanzu Operations Manager interface](#).

## Custom branding and Apps Manager

In the **Custom Branding** pane, you can customize the appearance of the TAS for VMs login portal and Apps Manager. In the **Apps Manager** pane, you can configure Apps Manager, and how it displays the

pages for your apps in the Marketplace.

To configure the **Custom Branding** and **Apps Manager** panes:

1. Select **Custom Branding**.
2. Configure the fields in the **Custom Branding** pane. For more information about the **Custom Branding** configuration settings, see [Custom-branding apps Manager](#).
3. Click **Save**.
4. Select **Apps Manager**.
5. (Optional) To allow inviting new users to Apps Manager, select the **Allow invitations to Apps Manager** check box. Space Managers can invite new users for a given space, Org Managers can invite new users for a given org, and Admins can invite new users across all orgs and spaces. For more information, see [Invite new users](#) in *Managing User Roles with Apps Manager*.
6. (Optional) To allow users to download documentation and cf CLI packages in air-gapped environments, select the **Allow access to offline tools** check box. When you select this check box, the cf CLI installer is included in the Apps Manager BOSH release and updates each time you apply changes in Tanzu Operations Manager.
7. Under **Included cf CLI packages**, select either **cf CLI v7** or **cf CLI v8**.
8. (Optional) To configure a custom name for your product page in the Marketplace, enter a name in **Product name**.
9. (Optional) To configure a custom name for the Marketplace page, enter a name in **Marketplace name**.
10. (Optional) To configure the Marketplace link in Apps Manager to go to your own marketplace, enter the URL for your marketplace in **Marketplace URL**.
11. (Optional) To configure secondary navigation links in the **Apps Manager** and **Marketplace** pages, enter link text and URLs under **Secondary navigation links**. You can configure up to 10 links in the Apps Manager secondary navigation.
12. (Optional) To display the prices for your services plans in the Marketplace, select the **Display service plan prices in Marketplace** check box.
13. (Optional) For **Marketplace currencies**, enter the currency codes and symbols you want to appear in the Marketplace as a JSON string. The default string is `{ "usd": "$", "eur": "€" }`.
14. (Optional) For **Apps Manager buildpack**, enter the name of the buildpack you want to use to deploy the Apps Manager app. The buildpack you specify must be for static content. The default buildpack is `staticfile_buildpack`. If you do not specify a buildpack, TAS for VMs uses the detection process to determine a single buildpack to use. For more information about the detection process, see [Buildpack detection](#) in *How Buildpacks Work*.
15. (Optional) For **Search Server buildpack**, enter the name of the buildpack you want to use to deploy the Search Server app. The buildpack you specify must be a node-based buildpack. The default buildpack is `nodejs_buildpack`. If you do not specify a buildpack, TAS for VMs uses the detection process to determine a single buildpack to use. For more information about the detection process, see [Buildpack detection](#) in *How Buildpacks Work*.

16. (Optional) For **Invitations buildpack**, enter the name of the buildpack you want to use to deploy the Invitations app. The buildpack you specify must be a node-based buildpack. The default buildpack is `nodejs_buildpack`. If you do not specify a buildpack, TAS for VMs uses the detection process to determine a single buildpack to use. For more information about the detection process, see [Buildpack detection](#) in *How Buildpacks Work*.
17. The **Apps Manager memory usage** field configures the memory limit with which to deploy the Apps Manager app. If the app fails to start and shows an `out of memory` error, increase the memory limit by modifying this field. Enter a value in MB. To use the default value of `128`, leave this field blank.
18. The **Search Server memory usage** field configures the memory limit with which to deploy the Search Server app. If the app fails to start and shows an `out of memory` error, increase the memory limit by modifying this field. Enter a value in MB. To use the default value of `256`, leave this field blank.
19. The **Invitations memory usage** field configures the memory limit with which to deploy the Invitations app. If the app fails to start and shows an `out of memory` error, increase the memory limit by modifying this field. Enter a value in MB. To use the default value of `256`, leave this field blank.
20. (Optional) If Apps Manager usage degrades Cloud Controller response times, you can configure **Apps Manager polling interval** to reduce the load on the Cloud Controller and ensure that Apps Manager remains available while you troubleshoot the Cloud Controller. VMware recommends that you only modify this field for as long as you are troubleshooting the Cloud Controller. If you do not modify this field back to its default value of `30` after you finish troubleshooting the Cloud Controller, it can degrade Apps Manager performance. You can modify this field in one of the following ways:
  - Increase the polling interval above the default value. Enter in seconds the duration you want the polling interval to last.

 If you enter a value between `0` and `30`, the field automatically reverts to `30`.

  - Disallow polling by entering `0`. This stops Apps Manager from refreshing data automatically, but users can update displayed data by reloading Apps Manager manually.
21. (Optional) If configuring the **Apps Manager polling interval** field above is not sufficient, you can further reduce the load on the Cloud Controller by also modifying **App details polling interval**. This field controls the rate at which Apps Manager polls for data when a user views the **Overview** page of an app. VMware recommends that you only modify this field for as long as you are troubleshooting the Cloud Controller. If you do not modify this field back to its default value of `10` after you finish troubleshooting the Cloud Controller, it can degrade Apps Manager performance. You can modify this field in one of the following ways:
  - Increase the polling interval above the default value. Enter in seconds the duration you want the polling interval to last.

 If you enter a value between `0` and `10`, the field automatically reverts to `10`.

- Disallow polling by entering `0`. This stops Apps Manager from refreshing data automatically, but users can update displayed data by reloading Apps Manager manually.
22. To configure multi-foundation support for Apps Manager, enter a JSON object containing all the foundations you want Apps Manager to manage in **Multi-foundation configuration (beta)**. Configuring multi-foundation support allows you to manage orgs, spaces, apps, and service instances from multiple TAS for VMs foundations from a single Apps Manager interface. For more information, see [Configuring multi-foundation support in Apps Manager](#).
  23. For **Redirect URIs**, enter a comma-separated list of the URI for each additional foundation you configured in **Multi-foundation configuration (beta)**.
  24. Click **Save**.

## Email notifications

In the **Email Notifications** pane, you can allow users to register their own Apps Manager accounts. TAS for VMs uses SMTP to email invitations and confirmations to Apps Manager users. If you do not need this service, leave this pane blank and deactivate the **Notifications** and **Notifications UI** errands in the **Errands** pane.

To configure the **Email Notifications** pane:

1. Select **Email Notifications**.
  2. For **From email**, enter the email address from which email notifications are sent.
  3. For **SMTP server address**, enter the SMTP address of the server that sends email notifications.
  4. For **SMTP server port**, enter the port of the SMTP server that sends email notifications.
-  For GCP, you must use port `2525`. Ports `25` and `587` are not allowed on GCP Compute Engine.
5. For **SMTP server credentials**, enter the user name and password for the SMTP server that sends email notifications.
  6. (Optional) To configure your SMTP server to automatically create a secure TLS connection when sending email notifications, select the **Use StartTLS protocol** check box.
  7. After you verify your authentication requirements with your email administrator, select **None**, **Plain**, or **CRAMMD5** from the **SMTP authentication mechanism** drop-down menu. If you have no SMTP authentication requirements, select **None**.
  8. If you selected **CRAMMD5** as your authentication mechanism, enter a secret in the **SMTP CRAMMD5 secret** field.
  9. Click **Save**.



If you do not configure the SMTP settings in the **Email Notifications** pane, an administrator for Apps Manager must create orgs and users through the cf CLI. For more information, see [Creating and managing users with the cf CLI](#).

## App Autoscaler

In the **App Autoscaler** pane, you configure the App Autoscaler service. To use App Autoscaler, you must create an instance of the service and bind it to an app. To create an instance of App Autoscaler and bind it to an app, see [Set up App Autoscaler](#) in *Scaling an App Using App Autoscaler*.

To configure the **App Autoscaler** pane:

1. Select **App Autoscaler**.
2. For **App Autoscaler instance count**, enter the number of instances of the App Autoscaler service you want to deploy. The default value is [3](#). For high availability, set this number to [3](#) or higher. Larger environments might require more instances than the default number. VMware recommends one App Autoscaler instance for every 10 apps using App Autoscaler.
3. For **App Autoscaler API instance count**, enter the number of instances of the App Autoscaler API you want to deploy. The default value is [1](#). Larger environments might require more instances than the default number.
4. For **Metric collection interval**, enter how many seconds of data collection you want App Autoscaler to evaluate when making scaling decisions. The minimum interval is 60 seconds, and the maximum interval is 3600 seconds. The default value is [120](#). Increase this number if the metrics you use in your scaling rules are emitted less frequently than the existing metric collection interval.
5. For **Scaling interval**, enter in seconds how frequently App Autoscaler evaluates an app for scaling. The minimum interval is 15 seconds, and the maximum interval is 120 seconds. The default value is [35](#).
6. To configure verbose logging for App Autoscaler, select the **Allow verbose logging** check box. Verbose logging is disallowed by default. Selecting the **Allow verbose logging** check box allows you to see more detailed logs. Verbose logs show specific reasons why App Autoscaler scaled the app, including information about instance limits and the status of App Autoscaler. For more information about App Autoscaler logs, see [Manage App Autoscaler Notifications](#) in *Scaling an App Using App Autoscaler*.
7. If you do not want the Autoscaler API to reuse HTTP connections, select the **Disallow API connection pooling** check box. This might be necessary if your front end idle timeout for the Gorouter is set to a low value, such as [1](#). For more information, see [Configuring front end idle timeout for Gorouter](#).
8. To allow App Autoscaler to email event notifications to space developers, select the **Send email notifications** check box. For more information about managing email notifications, see [Manage App Autoscaler notifications](#) in *Scaling an App Using App Autoscaler*.
9. Click **Save**.

## Advanced features

The **Advanced Features** pane includes new capabilities that might have certain constraints. Although these features are fully supported, VMware recommends caution when using them in production environments.

### Do not deploy Diego Cells

If you intend to deploy Diego Cells only through one or more isolation segment deployments, use this option to remove all Diego Cells from the TAS for VMs deployment. You might wish to do this to completely separate updates to Diego Cells from updates to the rest of the TAS for VMs deployment.



At least one isolation segment must deploy non-isolated Diego cell VMs so that the TAS for VMs installation has the shared Diego cells that are necessary to host system components that run as apps. Do not deploy app-based system components or run smoke-test errands until the non-isolated Diego cells in these isolation segment deployments are present.

## Diego Cell memory and disk overcommit

If your apps do not use the full allocation of disk space and memory set in the **Resource Config** tab, you might want use this feature. These fields control the amount to overcommit disk and memory resources to each Diego Cell VM.

For example, you might want to use the overcommit if your apps use a small amount of disk and memory capacity compared to the amounts set in the **Resource Config** settings for **Diego Cell**.



Due to the risk of app failure and the deployment-specific nature of disk and memory use, VMware has no recommendation for how much, if any, memory or disk space to overcommit.

To use overcommit:

1. Select **Advanced Features**.
2. In the **Diego Cell memory capacity** field, enter in MB the total desired amount of Diego Cell memory. See the **Diego Cell** row in the **Resource Config** tab for the current Diego Cell memory capacity settings that this field overrides.
3. In the **Diego Cell disk capacity** field, enter in MB the total desired amount of Diego Cell disk capacity. See the **Diego Cell** row in the **Resource Config** tab for the current Diego Cell disk capacity settings that this field overrides.
4. Click **Save**.



Entries made to each of these two fields set the total amount of resources allocated, not the overage.

## App graceful shutdown period

If your apps require a longer period of time to finish in-flight jobs and gracefully shut down, you can increase the graceful shutdown period. By default, this graceful shutdown period is set to 10 seconds.

When TAS for VMs requests a shutdown of an app, the processes in the container have a period of time to gracefully shut down before the processes are forcefully terminated. For more information, see [Shutdown in App Container Lifecycle](#).

If you significantly increase the value of the graceful shutdown period, platform upgrades and updates might become slower. This is because each Diego Cell uses the graceful shutdown period when it is cleaning up evacuated app instances and waits for each app to gracefully shut down.

VMware recommends using isolation segments to separate apps that have different shutdown requirements to ensure Diego Cell update times are reliable. For more information, see [Installing Isolation Segment](#).



To avoid unexpected behavior, you must ensure that **App graceful shutdown period** has the same value in all environments that have deployed apps.

To increase the app graceful shutdown period:

1. Select **Advanced Features**.
2. In the **App graceful shutdown period** field, enter the number of seconds that you want the platform to wait for an app instance to exit after it is signaled to gracefully shut down. The default and minimum value is [10](#).
3. Click **Save**.

## Non-RFC-1918 private network allow list

Some private networks require extra configuration so that internal file storage (WebDAV) can communicate with other TAS for VMs processes.

The **Non-RFC-1918 private network allow list** field is provided for deployments that use a non-RFC 1918 private network. This is typically a private network other than [10.0.0.0/8](#), [172.16.0.0/12](#), or [192.168.0.0/16](#).

Most TAS for VMs deployments do not require any modifications to this field.

To add your private network to the allow list:

1. Select **Advanced Features**.
2. Append a new `allow` rule to the existing contents of the **Non-RFC-1918 private network allow list** field. Include the word `allow`, the network CIDR range to allow, and a semi-colon (`;`) at the end. For example:

```
allow 172.99.0.0/24;
```

3. Click **Save**.

## cf CLI connection timeout

The **cf CLI connection timeout** field allows you to override the default five-second timeout of the Cloud Foundry Command Line Interface (cf CLI) used within your TAS for VMs deployment. This timeout affects the cf CLI command used to push TAS for VMs errand apps such as Notifications, App Autoscaler, and Apps Manager.

Set the value of this field to a higher value, in seconds, if you are experiencing domain name resolution timeouts when pushing errands in TAS for VMs.

To modify the value of the cf CLI connection timeout:

1. Select **Advanced Features**.
2. Enter a value, in seconds, to the **cf CLI connection timeout** field.
3. Click **Save**.

## (Optional) Allow TLS for internal system database

You can allow TLS communication for clients of the internal system database. This feature is in beta, and the **Allow TLS for internal MySQL database (beta)** check box is deselected by default. For more information about the internal system database, see [Managing internal databases](#).

To allow TLS communication for clients of the internal system database:

1. Select **Advanced Features**.
2. Select the **Allow TLS for internal MySQL database (beta)** check box.
3. Click **Save**.

## Database connection limits

You can configure the maximum number of concurrent database connections that Diego and container networking components can have.

To configure the maximum number of concurrent database connections:

1. Select **Advanced Features**.
2. Enter a value in each field beginning with **Maximum number of open connections...** for a given component. The placeholder values for each field are the default values.
3. Click **Save**.

When there are not enough connections available, such as during a time of heavy load, components might experience degraded performance and sometimes failure. To resolve or prevent this, you can increase and fine-tune database connection limits for the component.

Decreasing the value of this field for a component might affect the amount of time it takes for it to respond to requests.

## Maximum number of envelopes stored in Log Cache per source

By default, Log Cache keeps 100,000 envelopes per source. An envelope wraps an event and adds metadata. For sources that produce more than 100,000 envelopes, this default might not be long enough for you to specify a time period for a historical query.

To set the maximum number of envelopes stored per source above the default:

1. Select **Advanced Features**.
2. Enter the **Maximum number of envelopes stored in Log Cache per source**.
3. Click **Save**.

## Usage Service data retention period

By default, Usage Service deletes granular data after 365 days.

To configure this retention period:

1. Select **Advanced Features**.
2. In the **Usage Service data retention period** field, enter the number of days of granular data you want to retain.
3. Click **Save**.

To avoid performance or data migration issues, VMware recommends that you do not retain data for longer than 365 days. Configuring this field does not affect monthly summary records.

For more information, see [Usage data retention in Reporting App, Task, and Service Instance Usage](#).

## Metric Registrar



The Metric Registrar is included with TAS for VMs, and you configure it in the TAS for VMs tile. You do not install and configure Metric Registrar as a separate product tile.

In the **Metric Registrar** pane, you configure the Metric Registrar. The Metric Registrar allows TAS for VMs to convert structured logs into metrics. It also scrapes metrics endpoints and forwards the metrics to Loggregator.

The Metric Registrar requires the V2 Firehose to be enabled. Ensure that **Enable V2 Firehose** is selected on the **System Logging** pane.

If you configure the Metric Registrar, VMware recommends that you also run the Metric Registrar smoke test errand. For more information, see [Configure smoke tests](#).

### Deactivate the Metric Registrar

By default, the Metric Registrar is deployed.

To deactivate the Metric Registrar:

1. Select **Metric Registrar**.
2. Deselect the **Deploy Metric Registrar** check box.
3. Click **Save**.

### Edit default scraping interval

The scraping interval defines how often the Metric Registrar polls custom metric endpoints. The default is 35 seconds.

To edit the Metric Registrar scraping interval:

1. Select **Metric Registrar**.
2. Edit the **Endpoint scraping interval** field.
3. Click **Save**.

### Add blocked tags

To prevent the Metric Registrar from consuming the value of a metric or event tag, you can add the tag to the **Blocked tags** field. For example, if you tag your metrics with a `customer_id`, you might want to add `customer_id` to the list of blocked tags.

By default, the following tags are blocked to prevent interference with other products like App Metrics that use and rely on such tags.

- `deployment`
- `job`
- `index`
- `id`

To prevent the Metric Registrar from consuming the value of a metric or event tag:

1. Select **Metric Registrar**.
2. Add the desired tags to the **Blocked tags** field in a comma-separated list.
3. Click **Save**.

## Edit app instance metrics limit per scraping interval

The **App instance metrics limit per scraping interval** field defines how many metrics are emitted per app instance per interval. If the number of metrics an app instance generates within a scraping interval exceeds the configured limit, no metrics are emitted. Each individual Prometheus value is counted as one metric, including multiple values within the same metric family. By default, there is no limit.

To configure a metrics limit per scraping interval for app instances:

1. Select **Metric Registrar**.
2. Edit the **App instance metrics limit per scraping interval** field.
3. Click **Save**.

## TAS for VMs on vSphere requirements

Here are the requirements for installing VMware Tanzu Application Service for VMs (TAS for VMs) on vSphere. For general resource requirements, see [TAS for VMs resource requirements](#).

## vSphere requirements

The following are requirements for installing TAS for VMs that are specific to vSphere.

### Minimum resource Requirements for Operations Manager Deployment with TAS for VMs

The following are the minimum resource requirements for maintaining a [Operations Manager](#) deployment with TAS for VMs on vSphere:

- vSphere v8.0, v7.0, v6.7, or v6.5
- Disk space: 2 TB recommended

- Memory: 120 GB
- Two public IP addresses: One for TAS for VMs and one for Tanzu Operations Manager
- vCPU cores: 82
- Overall CPU: 28 GHz
- vSphere editions: Enterprise Plus or Platinum. These editions include Distributed Resource Scheduler (DRS), which is required by TAS for VMs.
- Tanzu Operations Manager must have HTTPS access to vCenter and ESX hosts on TCP port 443.
- A configured vSphere cluster:
  - If you enable vSphere DRS (Distributed Resource Scheduler) for the cluster, you must set the Automation level to **Partially automated** or **Fully automated**. If you set the Automation level to **Manual**, the BOSH automated installation will fail with a `power_on_vm` error when BOSH attempts to create virtual machines (VMs).
  - Deactivate hardware virtualization if your vSphere hosts do not support VT-X/EPT. If you are unsure whether the VM hosts support VT-x/EPT, you can deactivate this setting. If you leave this setting enabled and the VM hosts do not support VT-x/EPT, then each VM requires manual intervention in vCenter to continue powering on without the Intel virtualized VT-x/EPT. See the vCenter help topic at [Setting Virtual Processors and Memory](#) for more information.
- If you configure an external load balancer, an HTTP keep alive connection timeout greater than five seconds.



#### Note

If you are deploying Operations Manager behind a firewall, see [Preparing your firewall for deploying Operations Manager](#).

## Minimum resource requirements for Operations Manager deployment with Small Footprint TAS for VMs

The following are the minimum resource requirements for maintaining a Operations Manager deployment with Small Footprint TAS for VMs on vSphere:

- 1 vSphere cluster/1 AZ
- 2 resource pools: 1 for NSX-T components and 1 for TAS for VMs or TKGI
- 3 hosts minimum for vSphere HA (4 hosts for vSphere VSAN)
- Shared storage (Such as iSCSI, NFS, and VSAN)
- 1 NSX Manager
- 3 NSX controllers
- 4 large edge VMs in a cluster
- Operations Manager: Tanzu Operations Manager, the BOSH Director, and Small Footprint TAS for VMs

## Instance number and scaling requirements

By default, TAS for VMs deploys the number of VM instances required to run a highly available configuration of Operations Manager. If you are deploying a test or sandbox Operations Manager that does not require HA, then you can scale down the number of instances in your deployment.

For information about the number of instances required to run a minimal, non HA Operations Manager deployment, see [Scaling TAS for VMs](#).

## Quick Start TAS for VMs configuration

You can minimally configure VMware Tanzu Application Service for VMs (TAS for VMs) for evaluation or testing purposes. It does not include optional configurations such as external databases or external file storage.

For production deployments, VMware recommends following the procedure starting with [Prerequisites](#).

## Prerequisites

Before you begin, ensure that you have successfully completed the steps to prepare your environment for Operations Manager and install and configure the BOSH Director.

## Add TAS for VMs to VMware Tanzu Operations Manager

To add TAS for VMs to Tanzu Operations Manager:

1. If you have not already downloaded TAS for VMs, log in to [Broadcom Support](#) and click **VMware Tanzu Application Service for VMs**.
2. From the **Releases** drop-down menu, select the release to install and choose one of the following:
  3. Click **VMware Tanzu Application Service for VMs** to download the TAS for VMs `.pivotal` file.
  4. Click **Small Footprint TAS for VMs** to download the Small Footprint TAS for VMs `.pivotal` file.
5. Go to the Tanzu Operations Manager Installation Dashboard.
6. Click **Import a Product** to add your tile to Tanzu Operations Manager. For more information, see [Adding and Deleting Products](#).
7. Click the TAS for VMs tile.

## Configure TAS for VMs

To install TAS for VMs with minimal configuration:

1. Follow the procedure in [Assign AZs and Networks](#) in *Add TAS for VMs to Tanzu Operations Manager*.
2. Follow the procedure in [Configure Domains](#).
3. Select **Networking**.
4. Under **Certificates and private keys for the Gorouter**, you must provide at least one certificate and private key name and certificate key pair for the Gorouter. The Gorouter is activated to receive

TLS communication by default. You can configure multiple certificates for the Gorouter.



### Important

When providing custom certificates, enter them in this order: `wildcard`, `Intermediate`, `CA`. For more information, see [Creating a .pem File for SSL Certificate Installations](#) in the DigiCert documentation.

Click **Add** to add a name for the certificate chain and its private key pair. This certificate is the default used by the Gorouter. You can either provide a certificate signed by a Certificate Authority (CA) or click **Generate RSA Certificate** to generate a self-signed certificate in Tanzu Operations Manager.

If you configured Tanzu Operations Manager Front End without a certificate, you can use this new certificate to complete your Tanzu Operations Manager configuration. To configure your Tanzu Operations Manager Front End certificate, see [Configure Front End](#) in *Preparing to Deploy Tanzu Operations Manager on GCP*.

Ensure that you add any certificates that you generate in this pane to your infrastructure load balancer.

5. Set ASGs appropriately for a secure deployment:

1. Select **App Security Groups**.
2. Acknowledge **You are responsible for setting the appropriate ASGs after TAS for VMs finishes deploying**.
3. Click **Save**.

For more information about ASGs, see [App Security Groups](#) and [Restricting app access to internal TAS for VMs components](#).

4. Under **SAML service provider credentials**, enter a certificate and private key for the User Account and Authentication (UAA) server to use as a SAML service provider for signing outgoing SAML authentication requests. You can provide an existing certificate and private key from your trusted CA or generate a self-signed certificate. The domain `*.login.SYSTEM-DOMAIN` must be associated with the certificate, where `SYSTEM-DOMAIN` is the system domain you configured in the **Domains** pane.



### Important

The Single Sign-On for VMware Tanzu service and Spring Cloud Services for VMware Tanzu tiles require the `*.login.SYSTEM-DOMAIN`.

6. Select **UAA**.
7. If the private key specified under **SAML service provider credentials** is password-protected, enter the password in **Private key password**.
8. Select **CredHub**.

9. Under **Internal encryption provider keys**, specify one or more keys to use for encrypting and decrypting the values stored in the CredHub database:
  - **Name:** This is the name of the encryption key.
  - **Key:** This key is used for encrypting all data. The key must be at least 20 characters long.
  - **Primary:** This check box is used for marking the key you specified as the primary encryption key. You must mark one key as **Primary**. Do not mark more than one key as **Primary**.
10. Go to the **Internal MySQL** pane.
11. In the **Email address** field, enter the email address where the MySQL service sends alerts when the cluster experiences a replication issue or when a node is not allowed to auto rejoin the cluster.
12. Select **Resource Config**.
13. In the **Resource Config** pane, you must associate load balancers with the VMs in your deployment to activate traffic. For more information, see [Configure Load Balancing for TAS for VMs](#).

## Complete the TAS for VMs installation

To complete the TAS for VMs installation:

1. Click the **Installation Dashboard** link to return to the Tanzu Operations Manager Installation Dashboard.
2. Click **Review Pending Changes**, then **Apply Changes**.

## vSphere Virtual disk types

When you create a virtual machine in VMware vSphere, vSphere creates a new virtual hard drive for that virtual machine. The virtual hard drive is contained in a virtual machine disk (VMDK). The disk format you choose for the new virtual hard drive can have a significant impact on performance.

You can choose one of the following formats when creating a virtual hard drive:

- Thin-provisioned
- Thin-provisioned lazy-zeroed
- Thin-provisioned eager-zeroed

## Thin-provisioned

Advantages:

- Fastest to provision
- Allows disk space to be over-committed to VMs

Disadvantages:

- Slowest performance due to metadata allocation overhead and additional overhead during initial write operations

- Over commitment of storage can lead to application disruption or downtime if resources are actually used
- Does not support clustering features

When vSphere creates a thin-provisioned disk, it only writes a small amount of metadata to the datastore. It does not allocate or zero out any disk space. At write time, vSphere first updates the allocation metadata for the VMDK, then zeros out the block or blocks, then finally writes the data. Because of this overhead, thin-provisioned VMDKs have the lowest performance of the three disk formats.

You can use thin provisioning to over-commit disk spaces to VMs on a datastore. For example, you can put 10 VMs, each with a 50 GB VMDK attached to it, on a single 100 GB datastore, as long as the sum total of all data written by the VMs never exceeded 100 GB. Administrators can use thin provisioning to use space on datastores that can otherwise be unavailable. If you are using thick provisioning, you have the benefit of less latency because all storage is allocated at once possibly reducing costs and administrative overhead.

## Thin-provisioned lazy-zeroed

Advantages:

- Faster to provision than Thin-provisioned eager-zeroed
- Better performance than thin-provisioned

Disadvantages:

- Slightly slower to provision than thin-provisioned
- Slower performance than Thin-provisioned Eager Zero
- Does not support clustering features

When vSphere creates a Thin-provisioned lazy-zeroed disk, it allocates the maximum size of the disk to the VMDK, but does nothing else. At the initial access to each block, vSphere first zeros out the block, then writes the data. Performance of a Thin-provisioned lazy-zeroed disk is not as good a thick provisioned eager zero disk because of this added overhead.

## Thin-provisioned eager-zeroed

Advantages:

- Best performance
- Overwriting allocated disk space with zeros reduces possible security risks
- Supports clustering features such as Microsoft Cluster Server (MSCS) and VMware Fault Tolerance

Disadvantages:

- Longest time to provision

When vSphere creates a Thin-provisioned eager-zeroed disk, it allocates the maximum size of the disk to the VMDK, then zeros out all of that space.

Example: If you create an 80 GB Thin-provisioned eager-zeroed VMDK, vSphere allocates 80 GB and writes 80 GB of zeros.

By overwriting all data in the allocated space with zeros, Thin-provisioned eager-zeroed eliminates the possibility of reading any residual data from the disk, thereby reducing possible security risks.

Thin-provisioned eager-zeroed VMDKs have the best performance. When a write operation occurs to a Thin-provisioned eager-zeroed disk, vSphere writes to the disk, with none of the additional overhead required by thin provisioned or Thin-provisioned lazy-zeroed formats.

## Deploying TAS for VMs with NSX-T Networking

You can install VMware Tanzu Application Service for VMs (TAS for VMs) on vSphere with NSX-T internal networking, using the VMware NSX-T Container plug-in for Operations Manager.



### Important

These instructions were updated to use the NSX-T Policy API, the next-generation interface for integrating with the NSX-T networking and security framework.

TAS for VMs uses a Container Network Interface (CNI) plug-in to support secure and direct internal communication between containers.

This plug-in is either:

- The internal Silk plug-in that comes packaged with TAS for VMs.
- On vSphere, the NSX-T Container Plug-in (NCP), which is installed as the [VMware NSX-T Container Plug-in for Operations Manager](#) tile in Tanzu Operations Manager.

## Prerequisites

Before you deploy TAS for VMs with NSX-T networking, you must have the following:

- An NSX-T environment with NSX-T components that are installed and configured, including a Tier-0 gateway (configured in Active/Passive HA mode) attached to a North-South Transport Zone and NSX-T edge cluster. The NSX-T version must support the versions of NCP and TAS for VMs you intend to use. Verify the compatibility between NSX-T, NCP, and TAS for VMs with the following documentation:
  - Product Interoperability Matrix: [TAS for VMs](#), [VMware NSX-T](#), and [VMware NSX-T Container Plug-in for Operations Manager](#) for supported version combinations.
  - [VMware NSX Documentation](#). Start by reviewing the *NSX Container Plug-in (NCP) Release Notes* and the *NSX-T Data Center Installation Guide* for the versions of NCP and NSX-T that you want to install.
- BOSH and Tanzu Operations Manager installed and configured on vSphere. For more information, see [Deploying Tanzu Operations Manager on vSphere](#) and [Configuring BOSH Director on vSphere](#).
- The [VMware NSX-T Container Plug-in for Operations Manager](#) tile is downloaded from VMware Tanzu Network and imported to the Tanzu Operations Manager **Installation Dashboard**. For information about downloading and importing VMware Tanzu products to the Installation Dashboard, see [Add and Import Products](#) in *Adding and Deleting Products*.

- The **TAS for VMs tile** is downloaded from Broadcom Support and imported to the Tanzu Operations Manager Installation Dashboard. The TAS for VMs tile must be in one of these states:
  - Configured but not currently deployed. You did not click **Review Pending Changes**, then **Apply Changes** on this version of TAS for VMs.
  - Deployed previously, with the **Container network interface plug-in** field set to **External** in the **Networking** pane of the TAS for VMs tile.

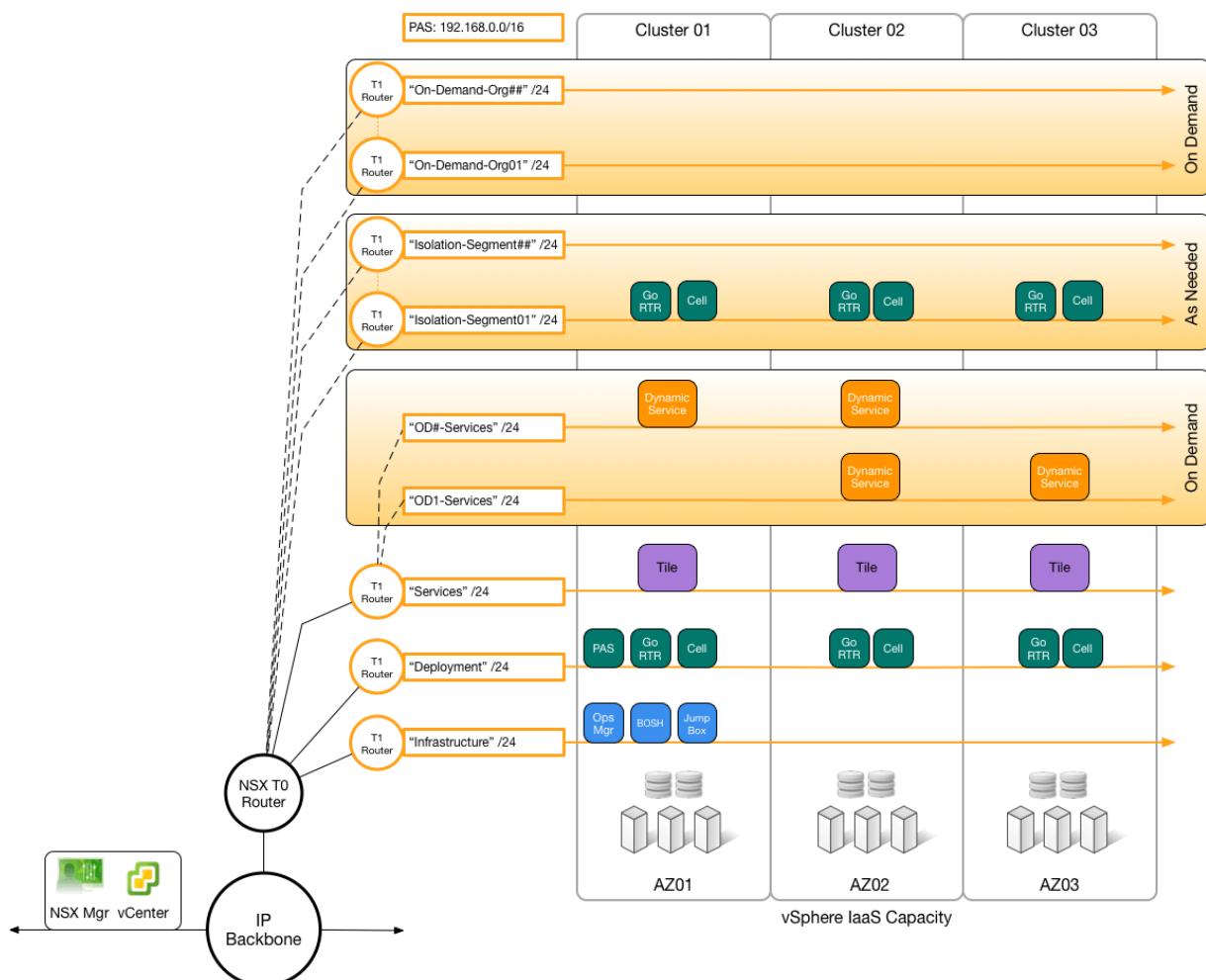


### Important

If you deploy TAS for VMs with its container network interface (CNI) set to **Silk**, Diego Cells are configured to use an internally managed container network. If you subsequently switch the CNI interface to **External** NSX-T, this leads to errors.

## Architecture

The following graphic shows how to deploy an NSX-T machine to run TAS for VMs across multiple vSphere hardware clusters. NSX-T runs a Tier-0 (T0) gateway and multiple Tier-1 (T1) gateways, each connecting to a network within Operations Manager. Each vSphere hardware column cluster corresponds to an Availability Zone (AZ) in Operations Manager: The NXT T0 Router is connected between the IP Backbone and the T1 Routers. The T1 Routers each end on a network.



When you push an app to a new org for the first time, the NSX-T plug-in starts NSX-T to create a new T1 gateway and allocate an address range for the org, on demand.

## Install and configure TAS for VMs and NSX-T

To install NSX-T to run with TAS for VMs, follow these procedures:

1. [Configure NSX-T to Integrate with TAS for VMs](#).
2. [Activate NSX-T Mode in the BOSH Director](#).
3. [Configure TAS for VMs for External Container Networking](#).
4. [Install and Configure the NSX-T Tile](#).

## Set up NSX-T to integrate with TAS for VMs

To set up NSX-T to integrate with TAS for VMs, follow these procedures:

- [Configure NAT Rules](#).
- [Configure Gateways](#).
- [Configure Segments](#).
- [Configure a Load Balancer](#).

## Configure NAT rules

To configure Network Address Translation (NAT) rules:

1. Create network address translation (NAT) rules to communicate with Tanzu Operations Manager:
  1. Go to **Networking**.
  2. Go to the **NAT** pane.
  3. Select your T0 gateway.
  4. Click **ADD NAT RULE**.
5. Add a rule for destination NAT (DNAT) with:
  - The externally-specified destination IP address of incoming requests. If your Tanzu Operations Manager has a DNS entry (for example, `opsmgr.example.com`), this is its IP address.
  - The Tanzu Operations Manager internal network address.
  - Firewall setting bypass: the packet bypasses firewall rules.

Name	Action	Match	Translated	Apply To	Enabled	Status
om-dnat *	DNAT	Source: Enter Source: 10.195.68.16 * Destination: Enter Destination: 192.168.1.10 *	Translated: 192.168.1.10 *	Set	<input checked="" type="checkbox"/> Enabled	
		Service: Set	Description: <input type="text"/>			
		Logging: No	Translated Port: Enter Translated Port: 0			
		Firewall: Bypass	Priority: 0	Note: A lower value means a higher priority. The default is 0		

#### 6. Add a rule for source NAT (SNAT) for the infrastructure and deployment networks:

- The externally-specified destination IP address.
- The internal network address in CIDR notation.
- Firewall Setting bypass: the packet bypasses firewall rules.

Name	Action	Match	Translated	Apply To	Enabled	Status
vm-snat *	SNAT	Source: Enter Source: 192.168.0.0/16 * Destination: Enter Destination: 10.196.68.25 *	Translated: 10.196.68.25 *	Set	<input checked="" type="checkbox"/> Enabled	
		Service: Set	Description: <input type="text"/>			
		Logging: No	Translated Port: Enter Translated Port: 0			
		Firewall: Bypass	Priority: 0	Note: A lower value means a higher priority. The default is 0		

## Configure gateways

To configure Tier-1 (T1) gateways:

- Create T1 gateways for TAS for VMs, to connect from the T0 gateway. For each Operations Manager network, Infrastructure, Deployment, and so on, create a T1 gateway as follows:
  - In the NSX-T Manager UI, go to **Networking**, then **Tier-1 Gateways**.
  - Click **ADD TIER-1 GATEWAY**.
  - Configure the gateway. Include the Edge Cluster, as it is required to activate the Load Balancer. The Infrastructure network gateway configuration looks similar to the following image:

**Tier-1 Gateways**

Name	HA Mode	Linked Tier-0 Gateway	Linked Segments	Status	Alarms
t1-infrastructure*	Active Star	TO	(X) ▾		
Edge Cluster*	Edge-cluster-1	(X) ▾		Fail Over	Non Preemptive
Auto Allocate Edges	<input checked="" type="checkbox"/> Yes			Standby Relocation	<input checked="" type="checkbox"/> No
Edges Pool Allocation Size	Select Pool Allocation Size			DHCP Config	Set
Description	Description			Tags	<input checked="" type="checkbox"/> Tag <input checked="" type="checkbox"/> Sco <input type="button" value="+"/> Max 30 allowed. Click (+) to add.
> Route Advertisement <small>NOTE - Before further configurations can be done, fill out mandatory fields (*) above and click Save.</small>					
> SERVICE INTERFACES > STATIC ROUTES > MULTICAST					
<input type="button" value="SAVE"/> <input type="button" value="CANCEL"/>					

2. Advertise the routes of the T1 gateways to the T0 gateway, so the T0 gateway can correctly route incoming requests based on their destination IP addresses:

1. Edit your T1 Gateway and go to **Route Advertisement**.
2. Activate **All Connected Segments & Service Ports**.
3. Activate **All LB VIP Routes**. (necessary if Load Balancing service is configured).

**Tier-1 Gateways**

Name	HA Mode	Linked Tier-0 Gateway	Linked Segments	Status	Alarms
t1-infrastructure*	Active Star	TO	(X) ▾		
Edge Cluster*	Edge-cluster-1	(X) ▾		Fail Over	Non Preemptive
Auto Allocate Edges	<input checked="" type="checkbox"/> Yes			Standby Relocation	<input checked="" type="checkbox"/> No
Edges Pool Allocation Size	Select Pool Allocation Size			DHCP Config	Set
Description	Description			Tags	<input checked="" type="checkbox"/> Tag <input checked="" type="checkbox"/> Sco <input type="button" value="+"/> Max 30 allowed. Click (+) to add.
> Route Advertisement All Static Routes <input checked="" type="checkbox"/> All NAT IP's <input checked="" type="checkbox"/> All DNS Forwarder Routes <input checked="" type="checkbox"/> All LB VIP Routes <input checked="" type="checkbox"/> All Connected Segments & Service Ports <input checked="" type="checkbox"/> All LB SNAT IP Routes <input checked="" type="checkbox"/> All IPsec Local Endpoints <input checked="" type="checkbox"/> <small>NOTE - Before further configurations can be done, fill out mandatory fields (*) above and click Save.</small>					
> SERVICE INTERFACES > STATIC ROUTES > MULTICAST					
<input type="button" value="SAVE"/> <input type="button" value="CANCEL"/>					

3. Allocate an IP block for TAS for VMs orgs.

1. From the NSX-T Manager, go to **Networking**, then **IP Address Pools**, click the **IP Address Blocks** tab, and click **Add IP Address Block**.

2. Enter a name (for example, `TAS for VMs-container-ip-block`). This IP block name is also used in the **VMware NSX-T** tile in the **NCP** section under **IP Blocks of Container Networks**.
3. Enter a description, such as `Subnets are allocated from this pool to each newly-created org`.
4. Enter a CIDR to allocate an address block large enough to accommodate all TAS for VMs apps. A `/14` CIDR is large enough for approximately 1,000 Orgs with about 250 apps each. If you are planning a large foundation, see [VMware NSX-T TAS for VMs limits](#) in the VMware documentation.

Name	Description	CIDR	Status
container-ip-block *	Subnets are allocated from this pool to each newly-created ORG	10.12.0.0/14 *	Active

4. Create an external SNAT IP pool:
  1. Go to **Networking**, then **IP Address Pools**.
  2. Click the **IP Address Pools** tab and then click **Add IP Address Pool**.
  3. Enter a name (for example, `external-ip-pool`).
  4. Enter a description (for example, “IP pool that provides 1 public IP for each TAS for VMs Org”). Later, you enter this pool name, on the **VMware NSX-T** tile, in the **NCP** section, under **IP Pools used to provide External (NAT) IP Addresses to Org Networks**.
  5. Set a subnet of externally-routable IP addresses for future NAT IP addresses.

Name	Description	Subnets	Allocated IPs	Status
external-ip-pool *	IP pool that provides 1 public IP for each TAS for VMs Org	1	0	Active

The screenshot shows a modal window titled "Set Subnets". At the top left is an "IP Address Pool" button, and at the top center is a "#IP Address Pool Subnets" button with the number "1". Below these are "ADD SUBNET" and "EXPAND ALL" buttons, and a search bar with a magnifying glass icon and the word "Search". The main area contains a table with two columns: "Source" and "IP Ranges / Block". A single row is visible, showing "IP Ranges" under "Source" and "10.195.68.128 - 10.195.68.250" under "IP Ranges / Block". There is also a small navigation icon (three dots followed by a right arrow) next to "IP Ranges".

5. In vSphere, create segments that correspond to the networks that Operations Manager uses.

1. Log in to the **NSX-T Manager Dashboard**.
2. Go to **Networking**.
3. Go to the **Segments** pane.
4. For each of these networks...
  - **Infrastructure** (BOSH and Tanzu Operations Manager, defined in the **Assign AZs and Networks** pane of the BOSH Director tile)
  - **Deployment** (TAS for VMs, defined in the **Assign AZs and Networks** pane of the TAS for VMs tile)
  - **Services and Dynamic Services** (marketplace services and on-demand services, also defined in the TAS for VMs tile)
  - **Isolation Segment** (optional, defined in the **Assign AZs and Networks** pane of the Isolation Segment tile) ...do the following:
    1. Click **ADD SEGMENT**.
    2. Enter a name for the segment.
    3. Enter a Gateway to connect to.
    4. Click **SAVE**.

Segments

**Segments** Segment Profiles Edge Bridge Profiles Metadata Proxies

**ADD SEGMENT**

Segment Name	Connected Gateway	Transport Zone	Subnets	Ports	Status
sf-infrastructure *	t1-infrastructure   Tier1 *	nsxt01-overlay	192.168.1/24 CIDR e.g. 10.22.12.2/23 Gateway CIDR IPv6 CIDR e.g. fc7e:f206:db42::1/48	Set	?

Segment needs to have either Subnets or VPN defined, or both.

Admin State

L2 VPN You have no L2 VPN sessions for this Gateway. For that, go to [VPN Services](#). Note that for L2 sessions to work, you also need IP Sec session defined.

VLAN Enter List of VLANs

Domain Name Enter Fully Qualified Domain Name

Metadata Proxy Select Metadata Proxy

Multicast Routing  Enabled

Address Bindings Set

URPF Mode Strict

Description Description

Connectivity

VPN Tunnel ID

Uplink Teaming Policy Select Uplink Teaming Policy

IP Address Pool Select IP Pool

Replication Mode Hierarchical Two-Tier replication

Tags  Tag Scope

Max 30 allowed. Click (+) to add.

NOTE - Before further configurations can be done, fill out mandatory fields above (\*), click 'Save' below.

> SEGMENT PROFILES

> DHCP STATIC BINDINGS

**SAVE** **CANCEL**

## Configure segments

1. Create Active Monitors (health checks) for use by the virtual servers later.
  1. In the NSX-T Manager UI, go to **Networking**, then **Load Balancing**, and click the **Monitors** tab.
  2. Create the health monitor for web load balancing:
  3. Click **Add Active Monitor**.
  4. Select **HTTP**.
    - **Name:** `tas-web-monitor`
    - **Monitoring Port:** 8080
    - **Monitoring Port:** 8080
  5. Configure **Additional Properties**:
    - **HTTP Request URL:** `/health`
    - **HTTP Response Code:** 200
  6. Click **Save**.
2. Create the health monitor for TCP load balancing:
  1. Click **Add Active Monitor**.
  2. Select **HTTP**.

- **Name:** `tas-tcp-monitor`
  - **Monitoring Port:** 80
3. Configure **Additional Properties**:
- **HTTP Request URL:** `/health`
  - **HTTP Response Code:** 200
4. Click **Save**.
3. Create the health monitor for SSH load balancing:
1. Click **Add Active Monitor**.
  2. Select **TCP**:
    - **Name:** `tas-ssh-monitor`
    - **Monitoring Port:** 2222
  3. Click **Save**.
4. Create Server Pools (collections of VMs that handle traffic) for use by the virtual servers.
1. In the NSX-T Manager UI, go to **Networking**, then **Load Balancing**, and click the **Server Pools** tab.
  2. Create the server pool for web load balancing:
    1. Click **Add Server Pool** to add a new pool.
      - **Name:** `tas-web-pool`
    2. Enter **SNAT Translation:** `Automap`
    3. Click **Select Members**:
      - **Membership Type:** `Static`
    4. Click **Active Monitor Set**:
      - Select `tas-web-monitor`
      - Click **Apply**
    5. Click **Save**.
  3. Create the server pool for TCP load balancing:
    1. Click **Add Server Pool** to add a new pool.
      - **Name:** `tas-tcp-pool`
    2. Enter **SNAT Translation:** `Deactivated`
    3. Click **Select Members**:
      - **Membership Type:** `Static`
    4. Click **Active Monitor Set**:
      - Select `tas-tcp-monitor`
      - Click **Apply**
    5. Click **Save**.

4. Create the server pool for SSH load balancing:
  1. Click **ADD SERVER POOL** to add a new pool.
    - **Name:** `tas-ssh-pool`
  2. Enter **SNAT Translation:** `Deactivated`
  3. Click **Select Members:**
    - **Membership Type:** `Static`
  4. Click **Active Monitor Set:**
    - Select `tas-ssh-monitor`
    - Click **Apply**
  5. Click **Save**.
5. Create the load balancer. In the NSX-T Manager UI, go to **Networking**, then **Load Balancing**, and click the **Load Balancers** tab.
  1. Click **Add Load Balancer**.
    1. Enter the fields:
      - **Name:** `tas-lb`
      - **Load Balancer Size:** Select `Small` unless you have a larger Foundation.
      - **Attachment:** `t1-deployment` Attach your load balancer to the Tier 1 gateway fronting your deployment instances.
    2. Click **Save**
    3. When you see **Want to continue configuring this Load Balancer?**, click **Yes**.
    4. Click **Virtual Servers Set**.
  6. Click **Add Active Monitor**.
  7. Select **HTTP**:
    - **Name:** `tas-web-monitor`
    - **Monitoring Port:** 8080.
  8. Configure **Additional Properties**:
    - **HTTP Request URL:** `/health`
    - **HTTP Response Code:** 200.
  9. Click **Save**.

For foundations requiring end-to-end encryption, do not enable the virtual server on port 80. If it must be enabled, configure it to redirect traffic to the encrypted port (443).

To create the virtual server that forwards unencrypted web (HTTP) traffic to the foundation:

1. Click **Virtual Servers Set**.
2. Click **Add Virtual Server**.
3. Select **L4 TCP**.
  - **Name:** `tas-web-vs`

- **Application Profile:** `default-tcp-lb-app-profile`
- **IP Address:** use the address of the DNS record of `*.system.YOUR-SYSTEM-DOMAIN.com`
- **Port:** `80, 443`
- **Server Pool:** `tas-web-pool`

4. Click **Save**.

To create the virtual server that forwards traffic to apps with custom tcp ports to the foundation:

1. Click **Add Virtual Server**.
2. Click **L4 TCP**.
  - **Name:** `tas-tcp-vs`
  - **Application Profile:** `default-tcp-lb-app-profile`
  - **IP Address:** use the address of the DNS record of `tcp.apps.YOUR-SYSTEM-DOMAIN.com`
  - **Port:** use the same ports as configured in the **TAS for VMs Tile**, then **Networking**, and **TCP Routing Ports**. For example: `1024-1123,5900`
  - **Server Pool:** `tas-tcp-pool`
3. Click **Save**.

To create the virtual server that forwards SSH traffic to the foundation:

1. Click **Add Virtual Server**.
2. Click **L4 TCP**.
  - **Name:** `tas-ssh-vs`
  - **Application Profile:** `default-tcp-lb-app-profile`
  - **IP Address:** Use the address of the DNS record of `ssh.system.YOUR-SYSTEM-DOMAIN.com`.
  - **Port:** `2222`
  - **Server Pool:** `tas-ssh-pool`
3. Click **Save**.

## Activate NSX-T Mode in the BOSH Director

To activate NSX-T mode in the BOSH Director:

1. From the Tanzu Operations Manager **Installation Dashboard**, open the **BOSH Director for vSphere** tile.
2. In the **vCenter Config** pane, click the pencil icon for the vCenter Config you want to edit.
3. Select **NSX Networking**.
4. Configure BOSH Director authentication to the NSX Manager by following the **NSX Networking** instructions in the [Step 2: Configure vCenter](#) section of *Configuring BOSH Director on vSphere*.
5. Verify that the **Use NSX-T Policy API** option is selected.

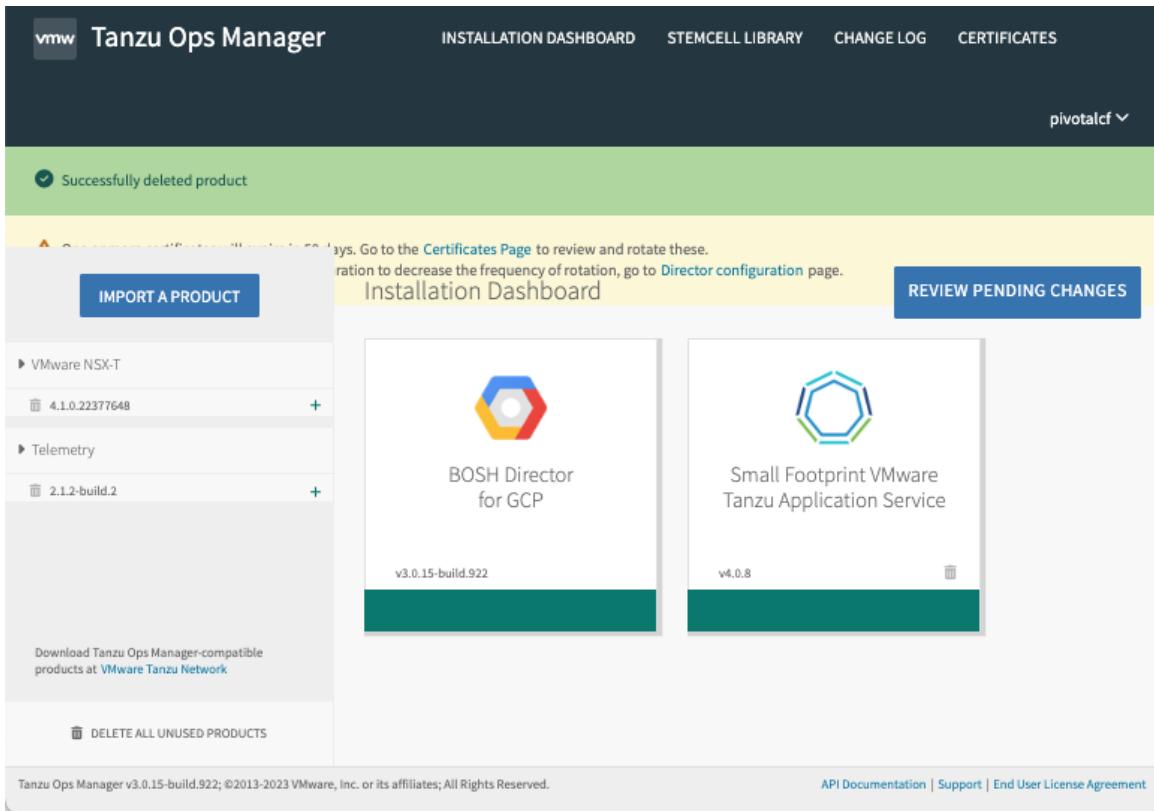
## Use NSX-T Policy API

### Configure TAS for VMs for external container networking

To configure TAS for VMs for external container networking:

1. If you have not already done so, download the TAS for VMs tile from [VMware Tanzu Network](#) and import it to the **Installation Dashboard**.

For instructions, see [Add and Import Products](#).



The screenshot shows the Tanzu Ops Manager interface. At the top, there's a navigation bar with tabs for INSTALLATION DASHBOARD, STEMCELL LIBRARY, CHANGE LOG, and CERTIFICATES. A dropdown menu shows 'pivotalcf'.

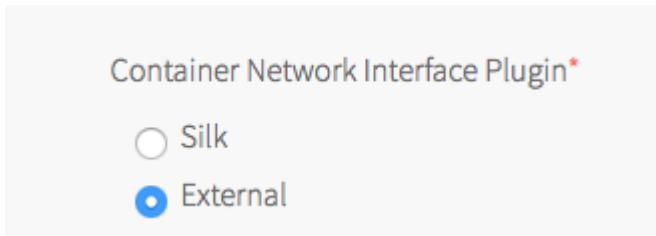
In the center, a green banner indicates a successful action: 'Successfully deleted product'. Below this, a yellow banner provides a warning about certificate rotation and links to the Certificates Page and Director configuration page.

On the left, a sidebar lists products under 'IMPORT A PRODUCT': 'VMware NSX-T' (version 4.1.0.22377648) and 'Telemetry' (version 2.1.2-build.2). There are '+' icons next to each entry.

On the right, two tiles are displayed: 'BOSH Director for GCP' (version v3.0.15-build.922) and 'Small Footprint VMware Tanzu Application Service' (version v4.0.8).

At the bottom, there are links for 'API Documentation | Support | End User License Agreement'.

2. Configure TAS for VMs, starting with [Prerequisites](#). When you configure **Networking**, select **External** under **Container networking interface plugin**.

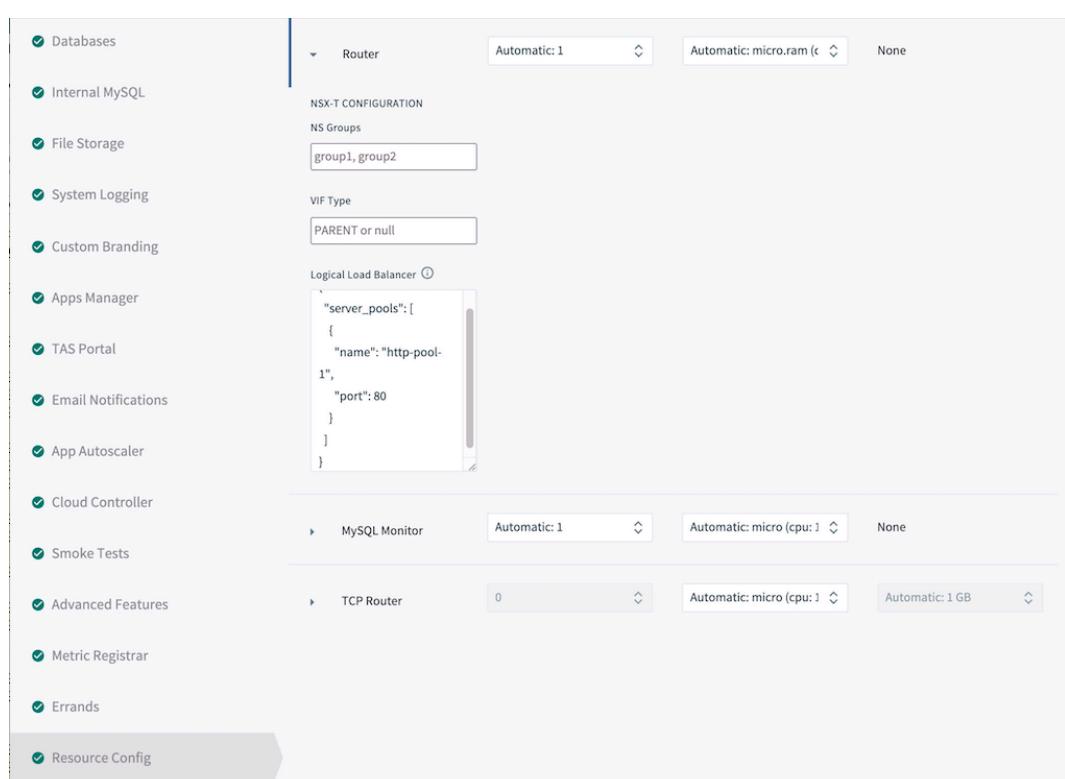


The screenshot shows a configuration dialog for the 'Container Network Interface Plugin'. The title is 'Container Network Interface Plugin\*'.

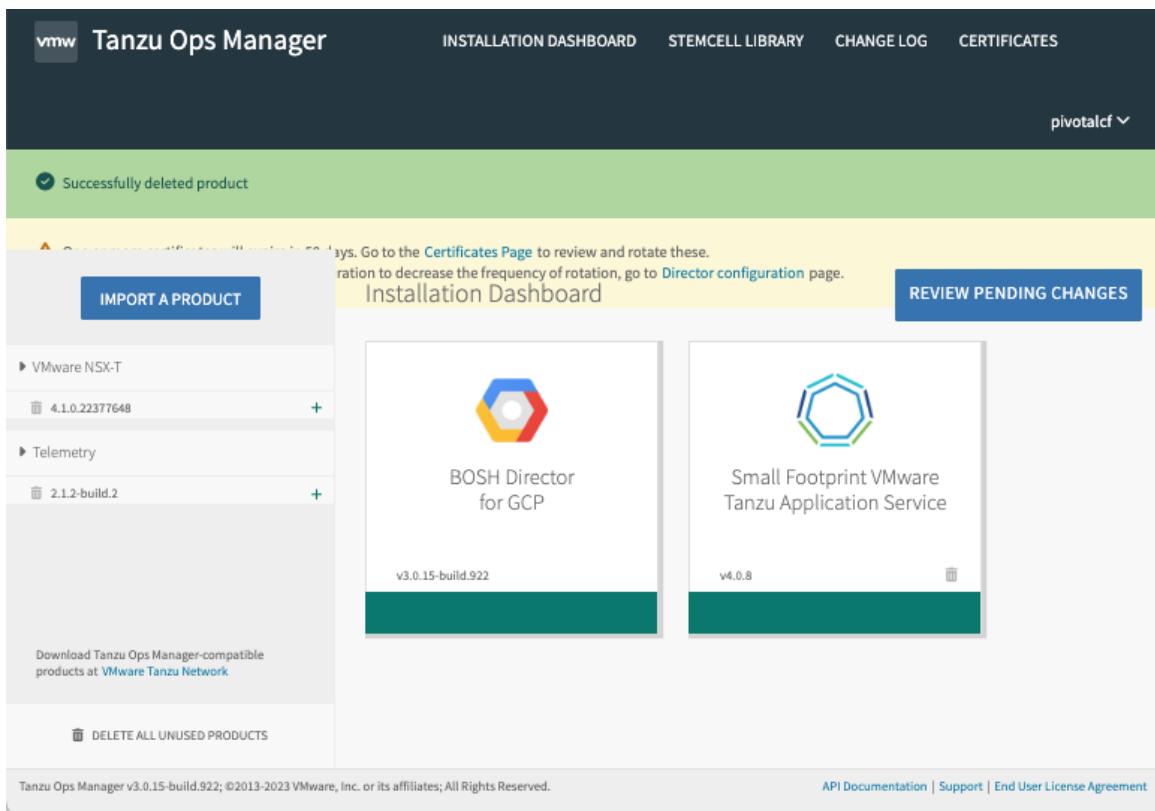
Two options are listed: 'Silk' (with an empty circle icon) and 'External' (with a blue circle icon). The 'External' option is selected.

### Install and configure the NSX-T container plug-in

1. Configure TAS for VMs to add router, diego\_brain, and tcp\_router instances to the corresponding NSX-T server pools upon deployment.
  1. Open the TAS for VMs tile, then click the **Resource Config** pane.
  2. Click the arrow next to each job to reveal the **NSX-T Configuration** column.
  3. Under **Logical Load Balancer**, complete the JSON `server_pools` list with the NSX-T Server Pool these instance must be added to upon deployment.
    - router: tas-web-pool
    - diego\_brain: tas-ssh-pool
    - tcp\_router: tas-tcp-pool
4. Click **Save**.



2. If you have not already done so, download the VMware NSX-T Container Plug-in for Operations Manager tile from [VMware Tanzu Network](#) and import it to the **Installation Dashboard**. For instructions, see [Add and Import Products](#).



3. Click the **VMware NSX-T** tile to open the **Settings** tab, and configure **NSX Manager**:
  - **NSX Manager Address:** The NSX-T Manager host address or IP address.
  - **Use Client Certificates or Username/Password:**
    1. If you are using VMware Workspace ONE Access, formerly called VMware Identity Manager (vIDM), click **Client Certificate Authentication**.
    2. Otherwise, select **Basic Authentication with Username and Password**, and enter **NSX Manager Admin Username** and **Admin Password** credentials in the fields underneath.
  - **NSX Manager CA Cert:** Obtain this certificate from NSX-T Manager as follows:
    1. `ssh` into NSX-T Manager using the admin account that you created when you deployed NSX-T Manager.
    2. From the NSX-T Manager command line, run `get certificate api` to retrieve the certificate.
4. Open and configure the **NCP** (NSX-T Container Plug-in) pane as follows:
  - **TAS for VMs Foundation Name:** If unsure, use `TAS for VMs`. If multiple foundations co-exist on the same NSX-T Manager, choose a unique string, such as `TAS for VMs-beta`. NCP creates artifacts such as T1 gateways and prefixes their names with this string for easy identification.
  - **Overlay Transport Zone:** A uniquely identifying string for the **Transport Zone** that you chose when you `created segments` for each network. This can be the name of the transport zone if no other zones in NSX-T share the same name, or else the UUID for the transport zone.

- **Tier-0 Router:** A uniquely identifying string for the T0 gateway. This can be the tag string that you gave the gateway in NSX-T Manager if no other T0 gateways in NSX-T share the same name, or else the UUID for the gateway.
- **IP Blocks of Container Networks:** Use the same IP block created in [Configure Gateways](#).
- **Subnet Prefix of Container Networks:** Subnet mask to set the address range size for apps in a single org. Defaults to 24. This number must be higher than the mask for all TAS for VMs orgs in the NSX-T Manager **New IP Block** pane, to define the fraction of the total TAS for VMs address space for each org.
- **IP Pools used to provide External (NAT) IP Addresses to Org Networks:** Use the same IP Pool created in [Configure Gateways](#).
- **Enable NSX-T Policy API:** Activate this check box to use the new Policy API.

**NCP Configuration**

PAS Foundation Name:

Overlay Transport Zone:

Tier-0 Router\*:

IP Blocks of Container Networks\*

Subnet Prefix of Container Networks\*:

Enable SNAT for Container Networks

IP Pools used to provide External (NAT) IP Addresses to Org Networks

external-ip-pool

Top Firewall Section Marker:

Bottom Firewall Section Marker:

Log Application Traffic\*

Disable

Deny Rules

All Rules (both Allow and Deny Rules)

Enable Debug Level for NCP Logging

Exit on Backend Connection Failure\*

Enable

Disable

The timeout time in seconds of removing all ovs ports.\*:

Enable NSX-T Container Inventory feature

Enable NSX-T Policy API If this option is enabled, NCP will connect to NSX Manager via Policy API.

Master Timeout (in seconds) (min: 18, max: 60)\*:

Enable Security Policy Notification

Use IPSet for default running ASG

Logging for SNAT Rule\*

None

Basic (Org SNAT)

Extended (both Org and App SNAT)

5. In the **NSX Node Agent** pane, activate the **Enable Debug Level of Logging for NSX Node Agent** check box.

# NSX Node Agent Configuration

- Enable Debug Level of Logging for NSX Node Agent

Save

6. Click **Save** and return to the **Installation Dashboard**.
7. After you configure both the **TAS for VMs** tile and the **VMware NSX-T** tile, click **Review Pending Changes**.
8. Click **Apply Changes** to deploy TAS for VMs with NSX-T networking.

## Upgrade TAS for VMs with NSX-T networking

After you deploy TAS for VMs with NSX-T, you might need to upgrade Tanzu Operations Manager, TAS for VMs, the NSX-T Container Plug-in or NSX-T Data Center. If you upgrade one of these components, you might need to upgrade the other components as well.

For example, if you want to only upgrade NSX-T Data Center, you might need to upgrade the NSX-T Container Plug-in first.

To upgrade TAS for VMs with NSX-T Networking:

1. Plan the upgrade by determining the compatibility of NCP, NSX-T and TAS for VMs by checking the following documentation:
  - [Product Interoperability Matrix: TAS for VMs, VMware NSX-T, and VMware NSX-T Container Plug-in for Operations Manager](#): To help you discover supported version combinations.
  - [VMware NSX Documentation](#): Start by reviewing the *NSX Container Plug-in (NCP) Release Notes* and *NSX-T Data Center Installation Guide* for the versions of NCP and NSX-T that you want to install.
2. Download the VMware NSX-T Container Plug-in for Operations Manager tile from [VMware Tanzu Network](#).
3. In Tanzu Operations Manager, import the new version of the tile to the **Installation Dashboard**. For instructions, see [Adding and Importing Products](#).
4. Click **Review Pending Changes** and review your changes.
5. Click **Apply Changes**.

Continue with the upgrade of Tanzu Operations Manager, TAS for VMs, or NSX-T Data Center. For more information, see [Upgrade NCP in a Operations Manager Environment](#) in the VMware NSX-T Data Center documentation.

## Deploying TAS for VMs to AVS

You can install VMware Tanzu Application Service for VMs (TAS for VMs) on Azure VMware Solution (AVS) with NSX-T internal networking, using the VMware NSX-T Container Plug-in.

AVS provides you with private clouds that contain vSphere clusters built from dedicated bare-metal Azure infrastructure.

AVS is a VMware-validated solution with ongoing validation and testing of enhancements and upgrades.

Microsoft Corporation manages and maintains private cloud infrastructure and software.

For more information about AVS, see the [Azure VMware Solution documentation](#).

All provisioned private clouds have vCenter Server, vSAN, vSphere, and NSX-T.

Deploying TAS for VMs to AVS is similar to traditional TAS for VMs deployments on vSphere, but there are a few minor differences due to the way that AVS deploys vSphere components.

To install NSX-T to run with TAS for VMs:

1. [Configure NSX-T to Integrate with TAS for VMs](#)
2. [Activate NSX-T Mode in the BOSH Director](#)
3. [Configure TAS for VMs for External Container Networking](#)
4. [Install and Configure the NSX-T Container Plug-in](#)

## Prerequisites

Before deploying TAS for VMs with NSX-T networking, you must have:

- BOSH and Tanzu Operations Manager installed and configured on vSphere. For more information, see [Deploying Tanzu Operations Manager on vSphere](#) and [Configuring BOSH Director on vSphere](#).
- The [VMware NSX-T Container Plug-in tile](#) downloaded from Broadcom Support and imported to the Tanzu Operations Manager Installation Dashboard. For information about downloading and importing VMware Tanzu products to the Installation Dashboard, see [Adding and Importing Products](#).
- The [TAS for VMs tile](#) downloaded from Broadcom Support and imported to the Tanzu Operations Manager Installation Dashboard. The TAS for VMs tile must be configured but not deployed yet. Configure the tile for the first time, but do not click **Review Pending Changes** or **Apply Changes**.
- The URLs and user credentials for your AVS private cloud vCenter and NSX-T Manager. See [Connect to the local vCenter of your private cloud](#) in the AVS documentation.

## Configure NSX-T to integrate with TAS for VMs

To set up NSX-T to integrate with TAS for VMs, complete these procedures:

- [Regenerate NSX-T Management TLS Certificate with a Valid SAN](#)
- [Configure Logical Switches](#)

- [Configure Routers](#)
- [Configure Load Balancer](#)

## Regenerate NSX-T management TLS certificate with a valid SAN

The AVS-deployed NSX-T Manager includes a self-signed TLS certificate with an invalid Subject Alternative Name (SAN). This causes issues when connecting from VMware Tanzu Operations Manager and the BOSH Director, so you must create a new certificate using the NSX-T Manager's fully qualified domain name (FQDN) or IP address as the new SAN.

For instructions, see [Generate and Register the NSX-T Management TLS Certificate and Private Key](#) in the VMware Tanzu Kubernetes Grid Integrated Edition (TKGI) documentation.

## Configure segments

To configure segments:

1. In vSphere, create logical network switches to correspond to the networks that your foundation uses.
2. Log in to the **NSX-T Manager Dashboard**.
3. Go to **Advanced Networking & Security**.
4. Go to the **Segment** page.
5. For each of these networks:
  - **Infrastructure** (BOSH and Tanzu Operations Manager, defined in the **Assign AZs and Networks** pane of the BOSH Director tile)
  - **Deployment** (TAS for VMs, defined in the **Assign AZs and Networks** pane of the TAS for VMs tile)
  - **Services and Dynamic Services** (marketplace services and on-demand services, also defined in the TAS for VMs tile)
  - **Isolation Segment** (optional, defined in the **Assign AZs and Networks** pane of the Isolation Segment tile)

Do the following:

1. Click **+Add**.
2. Enter a name for the segment (such as `TAS for VMs-Infrastructure`, `TAS for VMs-Deployment`).
3. Click **Add**.

# Add New Logical Switch



General    Switching Profiles

Name \* PAS-Infrastructure

Description

Transport Zone \* overlay-tz

Uplink Teaming Policy  
Name \*

Admin Status Up

Replication Mode  Hierarchical Two-Tier replication  
 Head replication

VLAN

Only VLAN Trunk Spec is allowed (eg: 1, 5, 10-12, 31-35).

CANCEL

ADD

## Configure gateways

Create T1 gateways for TAS for VMs, to connect from the T0 gateways. For each TAS for VMs network, Infrastructure, Deployment, and so on, create a T1 gateways as follows:

1. In the NSX-T Manager UI, navigate to **Advanced Networking & Security > Routing > Gateways**.
2. Click **+Add > Tier-1 Gateways**.
3. Configure the gateway to include the Edge Cluster. They are required to enable the Load Balancer.

The Infrastructure network gateway configuration might look like the following image:

# New Tier-1 Router



Tier-1 Router Advanced

Name \* T1-Router-PAS-Infrastructure

Description

Tier-0 Router TO-Router



Edge Cluster edge-cluster-1



StandBy Relocation  Disable

Failover Mode  Preemptive  Non-Preemptive

Edge Cluster Members [i](#) edge-transp-node-1 × edge-transp-node-2 ×



CANCEL

ADD



Create T1 gateway downlink ports for TAS for VMs.

For each T1 gateway you created, add a **New Router Port** to allow traffic in and out:

1. In the NSX-T Manager UI, select the T1 gateway.
2. Click **Edit** in the hamburger icon.
3. Go to **Services Interface**.
4. Click **Set**.
5. For **Segments**, enter the name of the segment you defined for the network in **Add New Segments**.
6. For **IP Address**, use the first IP of the appropriate subnet. In this example, 192.168.1.0/24 is set aside for Infrastructure (Tanzu Operations Manager and BOSH Director), and 192.168.2.0/24 for the

Deployment, so 192.168.1.1 and 192.168.2.1 are used respectively.

### New Router Port

[?](#) [X](#)

Name *	PAS-Infrastructure-dp				
Description	Downlink port connecting PAS-Infrastructure router to its Logical Switch				
Type	Downlink				
URPF Mode	<input checked="" type="radio"/> Strict <input type="radio"/> None				
Logical Switch	<a href="#">X</a> <a href="#">▼</a>				
<a href="#">OR Create a New Switch</a>					
Logical Switch Port	<input checked="" type="radio"/> Attach to new switch port <input type="radio"/> Attach to existing switch port				
Switch Port Name	PAS-Infrastructure-lp				
<b>Subnets</b>					
<a href="#">+ ADD</a> <a href="#">DELETE</a> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">IP Address *</th> <th style="width: 50%;">Prefix Length *</th> </tr> </thead> <tbody> <tr> <td>192.168.1.1</td> <td>24</td> </tr> </tbody> </table>		IP Address *	Prefix Length *	192.168.1.1	24
IP Address *	Prefix Length *				
192.168.1.1	24				
Relay Service <a href="#">X</a> <a href="#">▼</a>					
<a href="#">CANCEL</a> <a href="#">ADD</a> <a href="#">...</a>					

7. Advertise the routes of the T1 gateways to the T0 gateway, so the T0 gateway can correctly route incoming requests based on their destination IP address:
8. Click Gateway in the list.
9. Click the More Options menu and select Edit.
10. Expand **Route Advertisement**.
  1. Turn on **All Connected Segments & Service Ports** by using the green switch.
  2. Turn on All IPSec Local Endpoints.
  3. Turn on **All LB VIP Routes** by using the green switch(necessary if Load Balancing service is configured).

11. Navigate to IP Address Pools.
12. Click IP Address Pools in the navigation.
13. Click IP Address Blocks to allocate an IP block for TAS for VMs orgs.
14. Add IP Address Block.
15. Enter a name (for example, `TAS for VMs-container-ip-block`). This IP block name is also used in the **VMware NSX-T** tile in the **NCP** section under **IP Blocks of Container Networks**.
16. Enter a description, such as `Subnets are allocated from this pool to each newly-created org`.
17. Enter a CIDR to allocate an address block large enough to accommodate all TAS for VMs apps. A `/14` CIDR is large enough for ~1,000 Orgs with ~250 apps each. If you are planning such a large foundation, see **VMware NSX-T TAS for VMs limits** in the VMware documentation.

## Configure load balancer

To configure a load balancer:

Create Active Health Monitors (health checks) for use by the virtual server later on.

In the NSX-T Manager UI, navigate to **Advanced Networking & Security > Networking > Load Balancing > Monitors > Active Health Monitors**.

Create the health monitor for web load balancing:

1. Click **+Add**.
  1. Enter **Monitor Properties**:
    - **Name**: `pas-web-monitor`
    - **Health Check Protocol**: `LbHttpMonitor`
    - **Monitoring Port**: 8080
  2. Click **Next**.
  3. Enter **Health Check Parameters**:
    - **HTTP Method**: `GET`
    - **HTTP Request URL**: `/health`
    - **HTTP Response Code**: 200
  4. Click **Finish**.

Create the health monitor for TCP load balancing:

1. Click **+Add**.
2. Enter **Monitor Properties**: - **Name**: `pas-tcp-monitor` - **Health Check Protocol**: `LbHttpMonitor` - **Monitoring Port**: 80
3. Click **Next**.
4. Enter **Health Check Parameters**: - **HTTP Method**: `GET` - **HTTP Request URL**: `/health` - **HTTP Response Code**: 200

Create the health monitor for SSH load balancing:

1. Click **+Add**.
2. Enter **Monitor Properties**: - **Name**: `pas-ssh-monitor` - **Health Check Protocol**: `LbTcpMonitor` - **Monitoring Port**: 2222 -
3. Click **Next**, then click **Finish**.

Create server pools (collections of VMs which handle traffic) for use by the virtual server:

1. In the NSX-T Manager UI, navigate to **Advanced Networking & Security > Networking > Load Balancing > Server Pools**.
2. Create the server pool for web load balancing:
  1. Click **+Add** to add a new pool.
  2. Enter **General Properties**:
    - **Name**: `pas-web-pool`

3. Click **Next**.
4. Enter **SNAT Translation**:
  - **Translation Mode:** [IP List](#)
  - Enter a range of available IPs for SNAT translation. By default, ports from [4000](#) to [64000](#) are for all configured SNAT IP addresses. Allocate enough IPs to handle your traffic load. Without enough IPs, the SNAT port is exhausted.
5. Click **Next**.
6. Enter **Pool Members**:
  - **Membership Type:** [Static](#)
7. Click **Next**.
8. Enter **Health Monitors**:
  - **Active Health Monitor:** [pas-web-monitor](#)
9. Click **Finish**.

Create the server pool for TCP load balancing:

1. Click **+Add** to add new pool.
2. Enter **General Properties**: - **Name:** [pas-tcp-pool](#)
3. Click **Next**.
4. Enter **SNAT Translation**: - **Translation Mode:** [Transparent](#)
5. Click **Next**.
6. Enter **Pool Members**: - **Membership Type:** [Static](#)
7. Click **Next**.
8. Enter **Health Monitors**: - **Active Health Monitor:** [pas-tcp-monitor](#)
9. Click **Finish**.

Create the server pool for SSH load balancing:

1. Click **+Add** to add new pool.
2. Enter **General Properties** Name: [pas-ssh-pool](#)
3. Click Next.
4. Enter SNAT Translation: Translation Mode: Transparent
5. Click Next.
6. Enter Pool Members: Membership Type: Static
7. Click Next.
8. Enter Health Monitors: Active Health Monitor: [pas-ssh-monitor](#)
9. Click Finish. - **Name:** [pas-ssh-pool](#)
  1. Click **Next**.
  2. Enter **SNAT Translation**:

- **Translation Mode:** `Transparent`
3. Click **Next**.
  4. Enter **Pool Members**:
    - **Membership Type:** `Static`
  5. Click **Next**.
  6. Enter **Health Monitors**:
    - **Active Health Monitor:** `pas-ssh-monitor`
  7. Click **Finish**.

Create virtual servers.

1. In the NSX-T Manager UI, navigate to **Advanced Networking & Security > Networking > Load Balancing > Virtual Servers**.
2. Create the virtual server which forwards unencrypted web (HTTP) traffic to the foundation:



#### Important

Foundations requiring end-to-end encryption cannot activate the virtual server on port 80, or, if activated, configure it to redirect traffic to the encrypted port (443).

1. Click **+Add**.
2. Enter **General Properties**:
  - **Name:** `pas-web-vs`
  - **Application Type:** `Layer 4 (TCP)`
  - **Application Profile:** `nsx-default-lb-fast-tcp-profile`
3. Click **Next**.
4. Enter **Virtual Server Identifiers**:
  - **IP Address:** use the address of the DNS record of `*.system.YOUR-SYSTEM-DOMAIN.com`
  - **Port:** `80, 443`
5. Enter **Server Pool and Rules**:
  - **Default Server Pool:** `pas-web-pool`
6. Click **Next** several times, then click **Finish**.

Create the virtual server which forwards traffic to apps with custom ports to the foundation:

1. Click **+Add** to add a new virtual server.
2. Enter **General Properties**:
  - **Name:** `pas-tcp-vs`
  - **Application Type:** `Layer 4 (TCP)`
  - **Application Profile:** `nsx-default-lb-fast-tcp-profile`
3. Click **Next**.

4. Enter **Virtual Server Identifiers**:
  - **IP Address**: use the address of the DNS record of `tcp.apps.YOUR-SYSTEM-DOMAIN.com`
  - **Port**: use the same ports as configured in the **TAS for VMs Tile > Networking > TCP Routing Ports**, e.g. `1024-1123, 5900`
5. Click **Next**.
6. Enter **Server Pool and Rules**: \* **Default Server Pool**: `pas-tcp-pool`
7. Click **Next**, then click **Finish**.

Create the virtual server which forwards SSH traffic to the foundation:

1. Click **+Add** to add a new virtual server.
2. Enter **General Properties**:
  - **Name**: `pas-ssh-vs`
  - **Application Type**: `Layer 4 (TCP)`
  - **Application Profile**: `nsx-default-lb-fast-tcp-profile`
3. Click **Next**.
4. Enter **Virtual Server Identifiers**:
  - **IP Address**: use the address of the DNS record of `ssh.system.YOUR-SYSTEM-DOMAIN.com`
  - **Port**: `2222`
5. Click **Next**.
6. Enter **Server Pool and Rules**:
  - **Default Server Pool**: `pas-ssh-pool`
7. Click **Next**, then click **Finish**.

Create the load balancer:

1. In the NSX-T Manager UI, navigate to **Advanced Networking & Security > Networking > Load Balancing > Load Balancers**.
  1. Click **+Add**.
  2. Enter the fields:
    - **Name**: `pas-lb`
    - **Load Balancer Size**: Choose `Small` unless you have a larger Foundation
  3. Click **OK**.
2. Select `pas-lb`.
3. Click **Actions > Attach to a Virtual Server**, and then select `pas-web-vs`. Repeat this procedure for the Virtual Servers `pas-tcp-vs` and `pas-ssh-vs`.
4. Click **Action > Attach to a Logical Router**, and then select `T1-Router-TAS for VMs-Deployment`.

## Enable NSX-T mode in the BOSH Director

To activate NSX-T mode in the BOSH Director:

1. From the Tanzu Operations Manager **Installation Dashboard**, click the **BOSH Director** tile.
2. In the **vCenter Configs** pane, click the pencil icon for the vCenter Config that you want to edit.
3. Select **NSX Networking**.
4. Configure BOSH Director authentication to the NSX Manager by following the **NSX Networking** instructions in the [Step 2: Configure vCenter](#) section of *Configuring BOSH Director on vSphere*.

## Configure TAS for VMs for external container networking

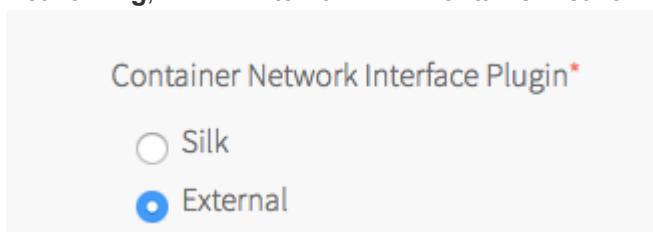
To configure TAS for VMs for external container networking:

1. If you have not already done so, download the TAS for VMs tile from [Broadcom Support](#) and import it to the **Installation Dashboard**. For instructions, see [Adding and Importing Products](#).

The screenshot shows the Tanzu Ops Manager interface with the following details:

- Header:** Tanzu Ops Manager, INSTALLATION DASHBOARD, STEMCELL LIBRARY, CHANGE LOG, CERTIFICATES, pivotalcf ▾
- Message Bar:** Successfully deleted product
- Import Section:** IMPORT A PRODUCT button, VMware NSX-T products listed: 4.1.0-22377648 and 2.1.2-build.2.
- Product List:**
  - BOSH Director for GCP:** v3.0.15-build.922
  - Small Footprint VMware Tanzu Application Service:** v4.0.8
- Footer:** Download Tanzu Ops Manager-compatible products at [VMware Tanzu Network](#), DELETE ALL UNUSED PRODUCTS button, Tanzu Ops Manager v3.0.15-build.922; ©2013-2023 VMware, Inc. or its affiliates; All Rights Reserved., API Documentation | Support | End User License Agreement

2. Configure TAS for VMs, following the directions in [TAS for VMs Overview](#). When you configure **Networking**, select **External** under **Container networking interface plugin**.



3. Update the server pool membership for the NSX-T load balancers:

1. Open the **BOSH Director for vSphere** tile > **Resource Config** pane.
2. Click the arrow next to each job to reveal the **NSX-T CONFIGURATION** column. See Step 10: Resource Config Pane in *Configuring BOSH Director on vSphere*.

- Under **Logical Load Balancer**, enter a JSON-formatted structure to defining a list of `server_pools` a VM extension for each of the three server pools: `pas-web-pool`, `pas-tcp-pool`, and `pas-ssh-pool`.

## Install and configure the NSX-T container plug-in

To install and configure the NSX-T Container Plug-In tile:

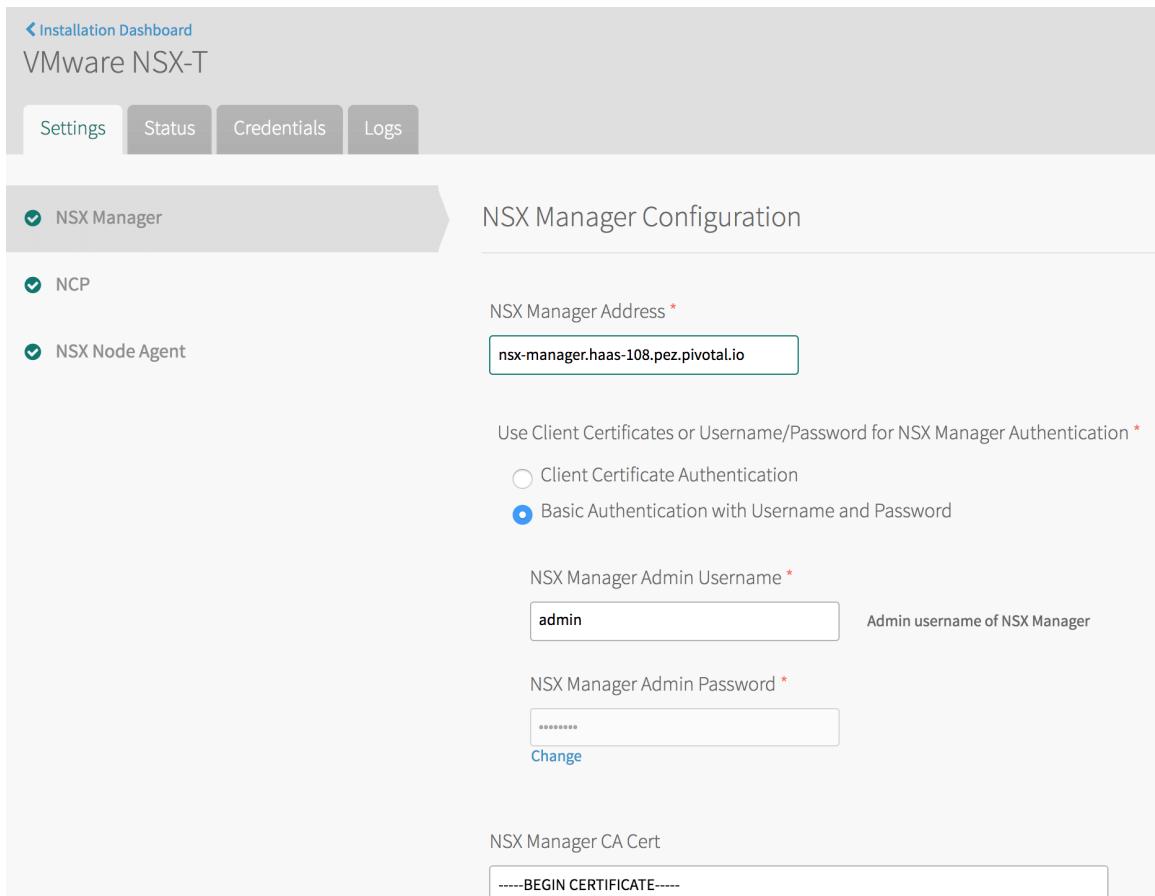
- If you have not already done so, download the VMware NSX-T Container Plug-in tile from [Broadcom Support](#) and import it to the **Installation Dashboard**. For instructions, see [Adding and Importing Products](#).

The screenshot shows the Tanzu Ops Manager interface with the following details:

- Header:** Tanzu Ops Manager, INSTALLATION DASHBOARD, STEMCELL LIBRARY, CHANGE LOG, CERTIFICATES, pivotalcf
- Left Sidebar:**
  - IMPORT A PRODUCT** button
  - VMware NSX-T** section:
    - 4.1.0.22377648
  - Telemetry** section:
    - 2.1.2-build.2
  - Download Tanzu Ops Manager-compatible products at VMware Tanzu Network**
  - DELETE ALL UNUSED PRODUCTS** button
- Middle Content:**
  - Installation Dashboard** section: Shows the imported tile for "BOSH Director for GCP" (v3.0.15-build.922) and "Small Footprint VMware Tanzu Application Service" (v4.0.8).
  - Review Pending Changes** button
- Bottom Footer:** Tanzu Ops Manager v3.0.15-build.922; ©2013-2023 VMware, Inc. or its affiliates; All Rights Reserved. API Documentation | Support | End User License Agreement

- Click the **VMware NSX-T** tile to open its **Settings** tab, and configure the **NSX Manager** pane as follows:
  - NSX Manager Address:** The NSX-T Manager host address or IP address.
  - Use Client Certificates or Username/Password:** Configure this setting as follows:
    - If you are using VMware Workspace ONE Access, formerly called VMware Identity Manager (vIDM), then select **Client Certificate Authentication**.
    - Otherwise, select **Basic Authentication with Username and Password** and enter **NSX Manager Admin Username** and **Admin Password** credentials in the fields underneath.
  - NSX Manager CA Cert:** Obtain this certificate from NSX-T Manager as follows:
    - SSH into NSX-T Manager using the admin account that you created when you deployed NSX-T Manager.

2. From the NSX-T Manager command line, run `get certificate api` to retrieve the certificate.



The screenshot shows the NSX Manager Configuration pane of the Installation Dashboard. It includes the following fields:

- NSX Manager Address \***: nsx-manager.haas-108.pez.pivot.al.io
- Authentication Method**: Basic Authentication with Username and Password (selected)
- NSX Manager Admin Username \***: admin
- NSX Manager Admin Password \***: \*\*\*\*\*
- NSX Manager CA Cert**: A text input field containing the placeholder "-----BEGIN CERTIFICATE-----".

3. Open and configure the **NCP** (NSX-T Container Plugin) pane as follows:
  - o **TAS for VMs Foundation Name**: If unsure, use `TAS for VMs`. If multiple foundations co-exist on the same NSX-T Manager, choose a unique string, such as `TAS for VMs-beta`. NCP creates artifacts, such as T1 routers and prefixes their names with this string for easy identification.
  - o **Overlay Transport Zone**: A uniquely identifying string for the **Transport Zone** that you chose when you `created segments` for each network. This can be the name of the transport zone if no other zones in NSX-T share the same name, or else the UUID for the transport zone.
  - o **Tier-0 Router**: A uniquely identifying string for the T0 router. This can be the tag string that you gave the router in NSX-T Manager if no other T0 routers in NSX-T share the same name, or else the UUID for the router.
  - o **Subnet Prefix of Container Networks**: Subnet mask to set the address range size for apps in a single org. Defaults to `24`. This number must be higher than the mask for all TAS for VMs orgs in the NSX-T Manager **New IP Block** pane, to define each org's fraction of the total TAS for VMs address space.
  - o **Enable SNAT for Container Network**: Select this check box.

NCP Configuration

PAS Foundation Name \*

Overlay Transport Zone \*

This string uniquely identifies the NSX overlay transport zone for logical switches for container networking. You can specify the name or the UUID of the transport zone to be used.

Tier-0 Router \*

IP Blocks of Container Networks

Subnet Prefix of Container Networks \*

Enable SNAT for Container Networks

IP Pools used to provide External (NAT) IP Addresses to Org Networks

Top Firewall Section Marker

Bottom Firewall Section Marker

Log Dropped Application Traffic

Enable Debug Level for NCP Logging

**Save**

- In the **NSX Node Agent** pane, select the **Enable Debug Level of Logging for NSX Node Agent** check box.

## NSX Node Agent Configuration

Enable Debug Level of Logging for NSX Node Agent

**Save**

- Click **Save** and return to the **Installation Dashboard**.
- After you have configured both the **TAS for VMs** tile and the **VMware NSX-T** tile, click **Review Pending Changes**.
- Click **Apply Changes** to deploy TAS for VMs with NSX-T networking.

## Deploying TAS for VMs to VCF

Use these instructions for installing VMware Tanzu Application Service for VMs (TAS for VMs) to VMware Cloud Foundation (VCF).

VCF is the hybrid cloud platform for managing VMs and orchestrating containers. You can install and configure Tanzu Operations Manager and (TAS for VMs) after launching the vSphere client through VCF.

## Prerequisites

Before you deploy TAS for VMs on VCF:

- Provision a VI workload domain on a Software Defined Data Center (SDDC). See [About VI Workload Domains](#).
- Download Tanzu Operations Manager for vSphere from [Broadcom Support](#).
- Download TAS for VMs from [Broadcom Support](#).
- Install the govc CLI to your local workstation or jump host. See [govmomi](#) on GitHub.

## Prepare to deploy TAS for VMs to VCF

To prepare VCF before you install TAS for VMs:

Collect your vCenter information:

1. In SDDC Manager, select **Workload Domains**.

The screenshot shows the vmw Cloud Foundation interface. The left sidebar contains navigation links: Dashboard, Solutions, Inventory (with Workload Domains selected), Lifecycle Management, Administration (with Network Settings, Storage Settings, Licensing, Users, Repository Settings, Composable Infrastructure, vRealize Suite, Security, Backup, VMware CEIP, and Developer Center), and a bottom section for Tanzu Application Service for VMs.

The main content area displays the SDDC Manager dashboard. It includes sections for Workload Domains (0 available, 2 used), Host Types (Hybrid Host, All Flash Host), Usage (13 Used), and Top Domains.

2. Select the VI domain where you want to install Tanzu Operations Manager and TAS for VMs.

**Workload Domains**

**Capacity Utilization across Domains**

Domain	Type	CPU Usage	Memory Usage	vSAN Storage Usage	NFS Stora Usage
sddcId-1001	MANAGEMENT	35% <span style="width: 35%;"> </span>	33% <span style="width: 33%;"> </span>	29% <span style="width: 29%;"> </span>	-
nsxt-vi	VI	24% <span style="width: 24%;"> </span>	76% <span style="width: 76%;"> </span>	16% <span style="width: 16%;"> </span>	-

3. Select the cluster where you want to install Tanzu Operations Manager and TAS for VMs.

The screenshot shows the VMware Cloud Foundation interface. The left sidebar contains navigation links: Dashboard, Solutions, Inventory (with Workload Domains), Hosts, Lifecycle Management, Administration (with Network Settings, Storage Settings, Licensing, Users, Repository Settings, Composable Infrastructure, vRealize Suite, Security, Backup, VMware CEIP, and Developer Center), and a summary of CPU usage.

The main content area displays the "nsxt-vi" workload domain. It shows the domain name, status (ACTIVE), and version (VMware Cloud Foundation Version : 4.2.0.0). Below this, a summary table provides details on CPU usage:

CPU	55.86 GHZ Total
13.35 GHZ Used	42.5 GHZ Free

Below the summary table is a table with columns: Clusters, Hosts, CPU Usage, and Memory Usage. It lists one cluster named "vi-cluster1" with 7 hosts, 24% CPU usage, and 76% memory usage.

- From the **Actions** menu, select **Open in vSphere Client**.

The screenshot shows the VMware Cloud Foundation interface. On the left, a sidebar menu includes options like Dashboard, Solutions, Inventory, Workload Domains (selected), Hosts, Lifecycle Management, Administration, Network Settings, Storage Settings, Licensing, Users, Repository Settings, Composable Infrastructure, vRealize Suite, Security, Backup, VMware CEIP, and Developer Center. The main content area displays the 'vi-cluster1' cluster summary. The cluster status is shown as ACTIVE with a green checkmark. Below this, there's a CPU usage bar indicating 55.86 GHZ Total, 13.35 GHZ Used, and 42.5 GHZ Free. A callout box over the 'Actions' button offers 'Add Host' and 'Open in vSphere Client'. At the bottom, tabs for 'Summary' (selected) and 'Hosts' are visible, along with sections for Virtual Infrastructure Configuration, Organization, vSAN Storage, and Storage Parameters (FTT = 0).

If you are using NSX-T, select **Workload Domains** and select the **Summary** tab. Record the IP address listed for **NSX Manager IP Address**.

## Next step

After you complete the procedures in this topic, continue to [Installing Tanzu Operations Manager on vSphere](#).

After you configure Tanzu Operations Manager, you can install and configure TAS for VMs.

## Deploying TAS for VMs to VMC

You can install VMware Tanzu Application Service for VMs (TAS for VMs) to VMware Cloud (VMC) on Amazon Web Services (AWS).

VMC provides Software Defined Data Centers (SDDCs) that run on AWS with a high level management console to configure networking rules.

This topic describes the procedures for configuring and installing TAS for VMs on VMC using public IP addresses for ingress.

To install and configure TAS for VMs on VMC:

1. [Install Tanzu Operations Manager.](#)
2. [Configure BOSH Director.](#)
3. [Install and Configure TAS for VMs.](#)

## Prerequisites

Before you install and configure TAS for VMs on VMC:

- Create a VMC account. See [VMware Cloud](#).
- Deploy an SDDC. See [Deploy an SDDC from the VMC Console](#).
- Enable browser access to vCenter from your SDDC. See [Enable Browser Access to vCenter](#).
- Download Tanzu Operations Manager for vSphere from [Broadcom Support](#).
- Download TAS for VMs from [Broadcom Support](#).
- Install the govc CLI to your local workstation or jump host. See [govmomi](#) on GitHub.

(Optional) If you plan to connect to the VMC SDDC using a VPN or Direct Connect Virtual Interfaces (VIFs):

- To use a VPN to connect your network to the VMC SDDC, configure the VPN connection before you install TAS for VMs. See [Configure a VPN Connection Between Your SDDC and On-Premises Data Center](#).
- To use VIFs to connect your network to the VMC SDDC, configure the VIFs before you install TAS for VMs. See [Configure AWS Direct Connect Between Your SDDC and On-Premises Data Center](#).

## Activate browser access to vCenter

By default, ingress to vCenter is not activated. If you are not using a VPN or other network, you must create a firewall rule in SDDC to allow vCenter access from your workstation's public IP address.

To activate browser access to vCenter:

1. Go to the [VMC console](#).
2. Select **SDDCs**.
3. Click **View Details** on your datacenter tile.
4. Select **Networking & Security**, and then select **Security**.
5. Click **Gateway Firewall**.
6. Click **Management Gateway**.
7. Click **+ Add Rule**.
  - **Name:** Enter `vCenter Browser Inbound Rule`.
  - **Sources:**
    1. Click **User Defined Groups**.
    2. Click **Add Group**.
      - For **Group name**, enter `public ip address`.
      - Click **Set Members**.

- Select **IP Addresses**.
  - Enter your public IP address. For example, `66.170.99.1`.  
You can locate your public IP address by going to  
`https://ifconfig.me/`.
  - Press **Enter**.
  - Click **Apply**.
3. Click **Save**.
- **Destinations:** Select **vCenter** and then click **Apply**.
  - **Services:** Enter `HTTPS, ICMP, SSO`.
8. Click **Publish**.

## Record vCenter credentials

To gather login credentials for the vCenter instance in your SDDC:

1. Go to the [VMC console](#).
2. Select **SDDCs**.
3. Click **Open vCenter** on your datacenter tile.
4. A dialog box appears with the text: **Before you can log into vCenter, you must open network access to vCenter through the management gateway**. Choose an option for opening network access.
5. Click **Show Credentials**.
6. Record the credentials.

After activating browser access and recording your vCenter credentials, you can access and authenticate with your cluster's vCenter server.

## Install Tanzu Operations Manager

To install Tanzu Operations Manager on VMC:

1. Find the VMC pre-installed network to use for the BOSH infrastructure network:
  1. Go to the [VMC console](#).
  2. Select **SDDCs**.
  3. Click **View Details** on your datacenter tile.
  4. Select **Networking & Security**.
  5. Select **Network**, and then select **Segments**.
  6. Record the segment name for **sddc-cgw-nework-1**.
  7. Record the subnet **192.168.1.1/24**. SDDC combines the gateway IP address and CIDR into a single value.
2. If nothing has changed, create a file named `options.json` with the following contents:

```
{
  "NetworkMapping": [
    {
      "Name": "Network 1",
      "Network": "sddc-cgw-network-1"
    }
  ],
  "PropertyMapping": [
    {
      "Key": "ip0",
      "Value": "192.168.1.10"
    },
    {
      "Key": "netmask0",
      "Value": "255.255.255.0"
    },
    {
      "Key": "gateway",
      "Value": "192.168.1.1"
    },
    {
      "Key": "DNS",
      "Value": "8.8.8.8"
    },
    {
      "Key": "ntp_servers",
      "Value": "time.google.com"
    }
  ]
}
```

- Replace the example text in the following code, then run the commands to upload the Tanzu Operations Manager file to VMC:

- EXAMPLE-PASSWORD**: the vCenter password you recorded in [Record vCenter Credentials](#).
- www.example.com**: your vCenter URL.
- PATH-TO-OPS-MANAGER**: the path to your Tanzu Operations Manager OVA file.

```
export GOVC_DATACENTER=SDDC-Datacenter
export GOVC_DATASTORE=WorkloadDatastore
export GOVC_RESOURCE_POOL=Compute-ResourcePool

export GOVC_URL='cloudadmin@vmc.local':'EXAMPLE-PASSWORD@www.example.com'

govc library.create tas
govc library.import tas PATH-TO-OPS-MANAGER
govc library.deploy -options options.json /tas/ops-manager-vsphere-2.##.#-build.## ops-manager
govc pool.create /SDDC-Datacenter/host/Cluster-1/Resources/az{1,2,3}
```

VMware recommends using `govc library.*` commands instead of `govc import.ova`.

The `govc import.ova` commands depend on access to the ESXi hosts, which is not configured by default in VMC. Using these commands can cause errors like the following: `govc: Post`

```
"https://10.2.32.4/nfc/5224a51f-114e-4627-8ca8-547c2e2e9488/disk-0.vmdk": dial tcp  
10.2.32.4:443: i/o timeout
```

4. Log in to vCenter:
  1. Go to the [VMC console](#).
  2. Select **SDDCs**.
  3. Click **Open vCenter** on your datacenter tile.
  4. Select **Show Credentials**, and then click **Open vCenter**.
  5. Find the Tanzu Operations Manager VM.
  6. Open the **Hosts & Clusters** view.
  7. Open the [Compute-ResourcePool](#) and select the `ops-manager` VM.
  8. Click ► to power on the Tanzu Operations Manager VM.
5. Create public IP addresses for Tanzu Operations Manager and HAProxy:
  1. Go to the [VMC console](#).
  2. Select **SDDCs**.
  3. Click **View Details** on your datacenter tile.
  4. Select **Networking & Security**.
  5. Select **Public IPs**, and then select **Request New IP**.
    1. For **Notes**, enter `ops-manager` and click **Save**.
    2. Record the IP address. For example, `54.190.190.190`.
  6. Click **Request New IP**.
    1. For **Notes**, enter `HAProxy` and click **Save**.
    2. Record the IP address. For example, `54.180.180.180`.
6. Create a second network segment to use as the BOSH deployment network:
  1. Go to the [VMC console](#).
  2. Select **SDDCs**.
  3. Click **View Details** on your datacenter tile.
  4. Select **Networking & Security**.
  5. Select **Network**, and then select **Segments**.
  6. Click **Add Segment**:
    1. For **Segment Name**, enter `bosh-network`.
    2. For **Type**, enter `routed`.
    3. For **Subnets**, enter a subnet. For example, `192.168.2.1/24`.
7. Assign public IP addresses to Tanzu Operations Manager and HAProxy:
  1. Go to the [VMC console](#).

2. Select **SDDCs**.
3. Click **View Details** on your datacenter tile.
4. Select **Networking & Security**.
5. Select **NAT**, and then click **Add NAT Rule**.
  1. For **Rule Name**, enter `ops-manager`.
  2. For **Public IP**, enter the IP address you created for Tanzu Operations Manager in a previous step. For example, `54.190.190.190`.
  3. For **Internal IP**, enter `192.168.1.10`.
  4. Click **Save**.
6. Select **Add NAT Rule**.
  1. For **Rule Name**, enter `HAProxy`.
  2. For **Public IP**, enter the IP address you created for HAProxy in a previous step. For example, `54.180.180.180`.
  3. For **Internal IP**, enter `192.168.2.2`.
  4. Click **Save**.
8. Add firewall rules that allow ingress to Tanzu Operations Manager and HAProxy:
  1. Go to the [VMC console](#).
  2. Select **SDDCs**.
  3. Click **View Details** on your datacenter tile.
  4. Select **Networking & Security**, and then select **Security**.
  5. Select **Gateway Firewall**, and then **Compute Gateway**.
  6. Click **Add Rule**.
  7. Select the newly-created rule:
    1. For **Rule Name**, enter `opsman-ingress`.
    2. For **Sources**, select **Any**.
    3. Configure **Destinations**:
      - Click **Add Group**.
        - For **Group name**, enter `OM`.
        - Click **Set Members**.
        - Select **IP Addresses**.
        - Enter the Tanzu Operations Manager internal IP address, `192.168.1.10`.
        - Press **Enter**.
        - Click **Apply**.
      - Click **Save**.

- Click **Apply**.
  - Click **Publish**.
8. Click **Add Rule**.
  9. Select the newly-created rule:
    1. For **Rule Name**, enter `HAProxy-ingress`.
    2. For **Sources**, select **Any**.
    3. Configure **Destinations**:
      - Click **Add Group**.
        - For **Group name**, enter `HAProxy`.
        - Click **Set Members**.
        - Select **IP Addresses**.
        - Enter the HAProxy internal IP address, `192.168.2.2`.
        - Press **Enter**.
        - Click **Apply**.
      - Click **Save**.
      - Click **Apply**.
      - Click **Publish**.
  9. Add a firewall rule that allows egress for the 192.168.1.x and 192.168.2.x subnets:
    1. Go to the **VMC console**.
    2. Select **SDDCs**.
    3. Click **View Details** on your datacenter tile.
    4. Select **Networking & Security**, and then select **Security**.
    5. Select **Gateway Firewall**, and then select **Compute Gateway**.
    6. Click **Add Rule**.
    7. Select the newly-created rule:
      1. For **Rule Name**, enter `tas-egress`.
      2. Edit **Sources**.
        - Click **Add Group**.
          - For **Group name**, enter `tas`.
          - Click **Set Members**.
          - Select **IP Addresses**.
          - Enter the first subnet CIDR, `192.168.1.0/24`.
          - Press **Enter**.
          - Enter the second subnet CIDR, `192.168.2.0/24`.
          - Press **Enter**.

- Click **Apply**.
  - Click **Save**.
3. Click **Apply**.
  4. For **Destinations**, select **Any**.
  8. Click **Publish**.
10. Add a firewall rule that allows ingress to vCenter from the TAS for VMs control plane:
1. Go to the [VMC console](#).
  2. Select **SDDCs**.
  3. Click **View Details** on your datacenter tile.
  4. Select **Networking & Security**, and then select **Security**.
  5. Click **Gateway Firewall**, and then select **Management Gateway**.
  6. Click **Add Rule**.
  7. Select the newly-created rule:
    1. For **Rule Name**, enter `vCenter Inbound Rule`.
    2. Edit **Sources**:
      - Click **User Defined Groups**.
      - Click **Add Group**.
        - For **Group name**, enter `Tanzu Operations Manager public IP`.
        - Click **Set Members**.
        - Select **IP Addresses**.
        - Enter your Tanzu Operations Manager public IP address. For example, `54.190.190.190`.
        - Press **Enter**.
        - Click **Apply**.
      - Click **Save**.
      - Click **Add Group**.
        - For **Group name**, enter `Workloads Compute NAT public IP`.
        - Click **Set Members**.
        - Select **IP Addresses**.
        - Enter your Workloads Compute NAT public IP address. For example, `44.232.216.160`.

You can locate your Workloads Compute NAT public IP address in the Networking & Security Overview.

    - Press **Enter**.
    - Click **Apply**.

- Click **Save**.
3. Edit **Destinations**: Select **vCenter** and then click **Apply**.
  4. Edit **Services**: Enter **HTTPS, ICMP, SSO**.
8. Click **Publish**.
11. Add a firewall rule that allows ingress to ESXi from the TAS for VMs control plane:
    1. Go to the **VMC console**.
    2. Select **SDDCs**.
    3. Click **View Details** on your datacenter tile.
    4. Select **Networking & Security**, and then select **Security**.
    5. Click **Gateway Firewall**, and then select **Management Gateway**.
    6. Click **Add Rule**.
    7. Select the newly-created rule:
      1. For **Rule Name**, enter **ESXi Inbound Rule**.
      2. Edit **Sources**:
        - Click **User Defined Groups**.
        - Click **Add Group**.
          - For **Group name**, enter **Tanzu Operations Manager private IP**.
          - Click **Set Members**.
          - Select **IP Addresses**.
          - Enter the Tanzu Operations Manager private IP address, **192.168.1.10**.
          - Press **Enter**.
          - Click **Apply**.
        - Click **Save**.
        - Click **Add Group**.
          - For **Group name**, enter **BOSH Director private IP**.
          - Click **Set Members**.
          - Select **IP Addresses**.
          - Enter the BOSH Director private IP address, **192.168.1.11**.
          - Press **Enter**.
          - Click **Apply**.
        - Click **Save**.
      3. Edit **Destinations**: Select **vCenter** and then click **Apply**.
      4. Edit **Services**: Enter **HTTPS, ICMP, SSO**.

8. Click **Publish**.

## Configure BOSH Director

The procedure in this section contains only the configuration information that is specific to VMC. For more information about configuring BOSH on vSphere, see [Configuring BOSH Director on vSphere](#).



### Important

When you configure the BOSH Director, do not configure NSX-T networking. Instead, select **Standard vCenter Networking**.

To configure BOSH Director for VMC:

1. Log in to Tanzu Operations Manager:
  - Go to the IP address you configured for Tanzu Operations Manager. For example, <https://54.190.190.190/>.
  - Enter a **Username**, **Password**, and **Password confirmation** to create an Admin user.
  - Enter a **Decryption passphrase** and the **Decryption passphrase confirmation**. This passphrase encrypts the VMware Tanzu Operations Manager datastore and is not recoverable.
2. Select the **BOSH Director for vSphere** tile and configure BOSH as follows:
  - **Settings**, then **vCenter Config**
    - **vCenter Host**: your vCenter URL. For example, `vcenter.sddc-35-162-72-214.vmwarevmc.com`.
    - **vCenter Username**: `cloudadmin@vmc.local`
    - **vCenter Password**: Enter the password you gathered from the SDDC.
    - **Datacenter Name**: Enter `SDDC-Datacenter`.
    - **Virtual Disk Type**: Select **Thin**.
    - **Ephemeral Datastore Names**: Enter `WorkloadDatastore`.
    - **Persistent Datastore Names**: Enter `WorkloadDatastore`.
    - Select **Standard vCenter Networking**.
  - **Settings**, then **Director Config**
    - **NTP Servers**: Enter an NTP server of your choice. For example, `time.google.com`.
  - **Settings**, then **Create Availability Zones**
    - **az1**:
      - **Name**: `az1`
      - **Clusters**:
        - **Cluster**: `Cluster-1`

- **Resource Pool:** az1
- **az2:**
  - **Name:** az2
  - **Clusters:**
    - **Cluster:** Cluster-1
    - **Resource Pool:** az2
- **az3:**
  - **Name:** az3
  - **Clusters:**
    - **Cluster:** Cluster-1
    - **Resource Pool:** az3
- **Settings**, then **Create Networks**, then **Networks**
  - **infra:**
    - **Name:** infra
    - **Subnets:**
      - **vSphere Network Name:** sddc-cgw-network-1
      - **CIDR:** 192.168.1.0/24
      - **Reserved IP Ranges:** 192.168.1.1-192.168.1.10
      - **DNS:** 8.8.8.8
      - **Gateway:** 192.168.1.1
      - **Availability Zones:** az1, az2, az3
  - **deployment:**
    - **Name:** deployment
    - **Subnets:**
      - **vSphere Network Name:** bosh-network
      - **CIDR:** 192.168.2.0/24
      - **Reserved IP Ranges:** 192.168.2.1
      - **DNS:** 8.8.8.8
      - **Gateway:** 192.168.2.1
      - **Availability Zones:** az1, az2, az3
- **Settings**, then **Assign AZs and Networks**
  - **Singleton Availability Zone:** az1
  - **Network:** infra
- **Settings**, then **Security**
  - **Include Tanzu Ops Manager Root CA in Trusted Certs:** Select the check box.

3. After you finish configuration, click **Apply Changes**. The following warning appears:

The screenshot shows a 'Review Pending Changes' interface. At the top, a yellow bar displays a warning: 'Please review the warnings below' and 'IaaS default: Could not log in: Required Datacenter privileges not available: ["Host.Inventory.EditCluster"], type: PrivilegeVerifier'. Below this, there's a table with a single row for 'BOSH Director Version 2.10.3-build.127'. The table includes columns for 'Select All Products', 'BOSH Director', 'Version 2.10.3-build.127', 'New Installation', and a blue button labeled 'IGNORE WARNINGS & APPLY CHANGES'.

Click **Ignore Warnings & Apply Changes**. `EditCluster` permission is not required.

## Install TAS for VMs

To configure TAS for VMs for VMC:

- Configure the **TAS for VMs** tile as follows:
  - Settings**, then **Assign AZs and Networks**
    - Network**: Select `deployment`.
    - Click **Save**.
  - Settings**, then **Domains**
    - Set up a wildcard domain and ensure that it maps to the HAProxy public IP address you configured earlier. For example:
      - System domain**: `sys.54.180.180.180.nip.io`
      - Apps domain**: `run.54.180.180.180.nip.io`
  - Settings**, then **Networking**
    - Set the HAProxy IP address to the one you specified in the NAT rule. This is the first available IP address in the `deployment` network.
      - HAProxy IPs**: `192.168.2.2`
    - Generate a certificate for the Gorouter and HAProxy:
      - Certificates and private keys for the Gorouter and HAProxy**: Click **Add**.
        - Name**: `haproxy cert`
        - Click **Generate RSA Certificate**.
        - Add `*.domains` for your system and apps domain, separated by a comma. For example,  
`*.sys.54.180.180.180.nip.io,*.run.54.180.180.180.nip.io`
    - Set HAProxy as the TLS termination point:
      - TLS Termination**: **HA Proxy**
    - Deactivate TLS forwarding for HAProxy:
      - HAProxy forwards all requests to the Gorouter over TLS**: Click **Disable**.
  - Settings**, then **UAA**
    - For UAA configuration, generate a SAML certificate for `*.login.SYSTEM-DOMAIN`:

- **SAML service provider credentials**
    - Click **Generate RSA Certificate**.
    - Enter your domain. For example,  
\*.login.sys.54.180.180.180.nip.io
    - Click **Generate**.
  - **Settings**, then **Resource Config**:
    - Scale the HAProxy instances up to 1.
    - **HAProxy**
      - Set Instances to **1**.
      - Click **Save**.
2. After you finish configuration, click **Apply Changes**. The following warning appears again:
- 
3. Click **Ignore Warnings & Apply Changes**. `EditCluster` permission is not required.

## TAS for VMs [Windows]

In this section:

- [TAS for VMs \[Windows\] overview](#)
- [Windows Diego Cell architecture](#)
- [Installing and configuring TAS for VMs \[Windows\]](#)
- [Downloading or creating Windows stemcells](#)
- [Creating a Windows stemcell for vSphere using stembuild](#)
- [Windows Diego Cells in isolation segments](#)
- [Windows authentication for .Net apps](#)
- [Upgrading TAS for VMs \[Windows\] and Windows stemcells](#)
- [Migrating apps to TAS for VMs \[Windows\]](#)
- [Troubleshooting Windows Diego Cells](#)

## TAS for VMs [Windows] overview

VMware Tanzu Application Service for VMs [Windows] help you provision, operate, and manage Windows stemcells on Operations Manager.

After you install the TAS for VMs [Windows] tile on the VMware Tanzu Operations Manager Installation Dashboard, developers can push .NET apps to Windows Diego Cells using the [Cloud Foundry Command](#)

Line Interface (cf CLI).

For the TAS for VMs [Windows] release notes, see [VMware Tanzu Application Service for VMs \[Windows\] v6.0 Release Notes](#).

## Requirements

To install the TAS for VMs [Windows] tile, you must have:

- Tanzu Operations Manager 3.0 and VMware Tanzu Application Service for VMs v6.0 deployed to vSphere, Amazon Web Services (AWS), Google Cloud Platform (GCP), or Azure.
- A Windows stemcell. For information about obtaining or creating a Windows stemcell, see [Downloading or creating Windows stemcells](#).

The minimum resource requirements for each Windows Diego Cell are:

- Disk size: 64 GB (100 GB recommended)
- Memory: 16 GB
- CPUs: 4

## Contents

### About TAS for VMs [Windows]

- [Product architecture](#)

### Installation guide

- [Downloading or creating Windows stemcells](#).
- [Creating a Windows stemcell for vSphere using stembuild](#).
- [Installing and configuring TAS for VMs \[Windows\]](#).
- [Windows Diego Cells in isolation segments](#).
- [Migrating apps to TAS for VMs \[Windows\]](#).

### Admin guide

- [Upgrading TAS for VMs \[Windows\] and Windows stemcells](#).
- [Troubleshooting Windows Diego Cells](#).

### Developer guide

- [Deploying .NET apps](#).
- [Using SMB volumes in .NET apps](#).
- [Changing Windows Stacks](#).
- [Tips for .NET developers](#).

## Limitations

Here are the limitations that affect Windows containers in TAS for VMs [Windows]:

- [Windows Server container limitations](#)
- [TAS for VMs \[Windows\] limitations](#)

### Windows server container limitations

Windows Server Core Containers are used in TAS for VMs [Windows].

These are known Windows Server container limitations:

- Windows Server Core containers support the host VM's time zone only. In TAS for VMs [Windows], the host and container time zone is always UTC.
- Windows Server 2019 Core images support only Lucida Console font. No other fonts are supported, and no others can be installed.

### TAS for VMs [Windows] limitations

TAS for VMs [Windows] has the following limitations:

- TAS for VMs [Windows] can be installed in an environment with the NSX Container Plugin (NCP), but NCP cannot be used with Windows containers in TAS for VMs [Windows]. For more information about NCP, see [What's New](#) in the VMware documentation.
- Developers cannot push Docker or other OCI-compatible images to Windows Diego Cells.
- Container-to-container networking is not available for Windows-hosted apps.
- OpenStack is not supported for TAS for VMs [Windows]. Contact your VMware representative for information about OpenStack deployments.
- SMB is supported, but Volume Services is not supported.
- Due to Known Issue #244 in Windows Server OS, apps hosted on TAS for VMs [Windows] cannot route traffic when deployed with the IPsec. For more information, see [Traffic to containers via NAT stops working when using IPsec to encrypt network connections](#) on GitHub.

## Windows Diego Cell architecture

You can deploy the architecture of Windows Diego Cells that VMware Tanzu Application Service for VMs [Windows] uses to run containerized .NET apps and the stemcells that it supplies to BOSH as the operating system for the Windows Diego Cell VMs.

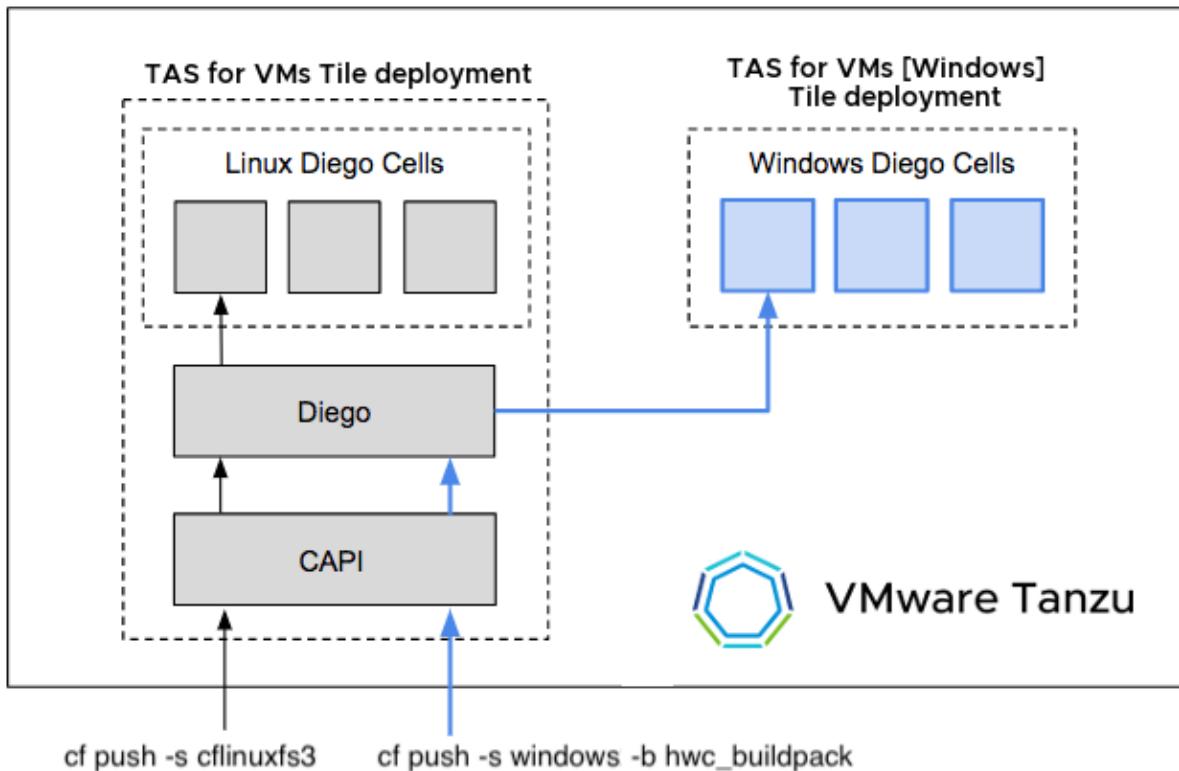
You can run Windows Diego Cells in Operations Manager to enable developers to push .NET apps, to deploy the TAS for VMs [Windows] tile.

When you deploy this tile, it creates a separate BOSH deployment populated with the Garden Windows release, which runs on a Windows Diego Cell built from a Windows stemcell.

After the Windows Diego Cell is running, developers can specify a Windows stack when pushing .NET apps from the command line.

Operations Manager passes the app to the Windows Diego Cell in the TAS for VMs [Windows] BOSH deployment.

The following diagram illustrates the process:



## Windows cells

App instances in Operations Manager run inside containers. Garden is the API that creates and manages these containers. An implementation equivalent to that on Linux Diego Cells provides this infrastructure on Windows Diego Cells, using native Windows Server containers.

By installing the TAS for VMs [Windows] tile, operators create a Windows Diego Cell from a stemcell that contains the Windows Server operating system. Garden on Windows uses Windows containers to isolate resources on Windows Diego Cells that Operations Manager manages alongside Linux Diego Cells.

For more information about installing the TAS for VMs [Windows] tile, see [Installing and configuring TAS for VMs \[Windows\]](#).

For more information about Garden, see [Garden](#). For more information about Diego Cells, see [Diego Cell in TAS for VMs Components](#). For more information about stemcells, see the [BOSH documentation](#). For more information about Windows containers, see the [Microsoft documentation](#) in the Microsoft documentation.

## Components

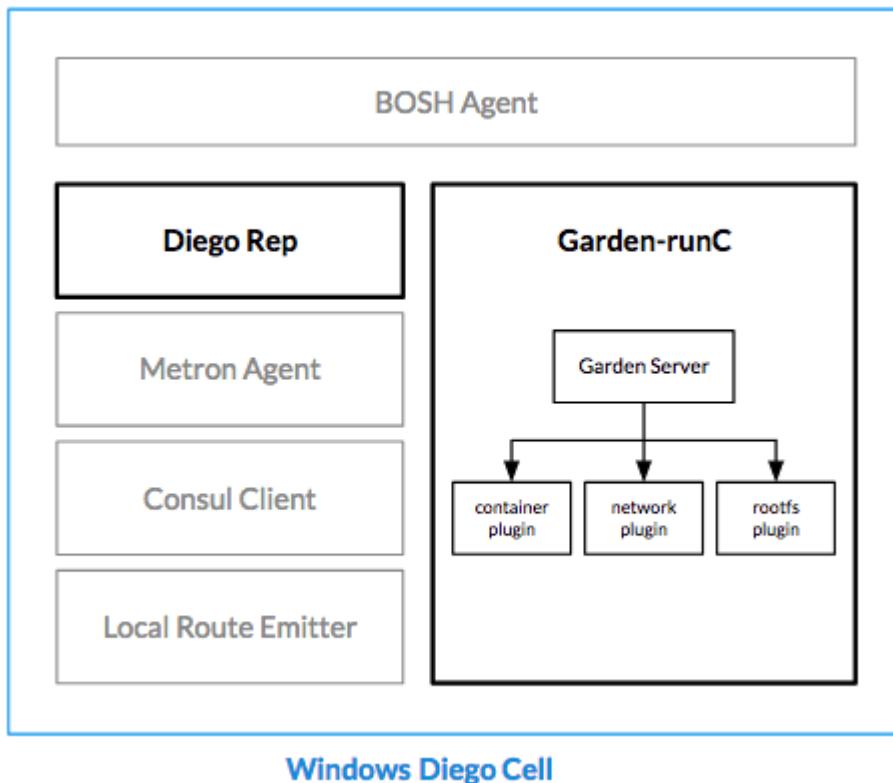
A Windows Diego Cell includes the following components:

- Guardian: Implements the Garden API on Windows.
- Loggregator Agent: Forwards app logs, errors, and metrics to the Loggregator system. For more information about the Loggregator Agent, see [Sends logs to Loggregator](#) in *Diego components and*

*architecture.* For more information about Loggregator, see [Loggregator architecture](#).

- BOSH Agent: Executes instructions from the BOSH Director. For more information, see the [BOSH documentation](#).
- Diego Rep: For more information, see [Tasks and long-running processes](#) in *How Diego Balances App Processes*.

The following diagram illustrates the architecture of a Windows Diego Cell:



## Container implementation

Garden on Windows uses these runtime plug-ins to create and manage Windows containers for VMware Tanzu Application Service for VMs:

- Container plug-in `winc`: Creates Open Container Initiative (OCI)-compliant containers, executes processes in the containers, and sets their CPU and RAM limits. For more information about OCI compliance, see the [Open Container Initiative](#) website.
- Network plug-in `winc-network`: Creates a network compartment for the container, applies its DNS settings, and defines its inbound and outbound network access rules.
- Rootfs image plug-in `groot`: Sets up the container file system volume and uses the File Server Resource Manager (FSRM) API to define its disk usage quotas. For more information about the FSRM, see the [Microsoft documentation](#).
- Rootfs image plug-in `groot`: Sets up the container file system volume and uses the File Server Resource Manager (FSRM) API to define its disk usage quotas. For more information about the FSRM, see the [Microsoft documentation](#).

## Windows stemcells

A stemcell is a customized operating system image containing the file system for BOSH-managed VMs. When deployed, the operating system includes the BOSH Agent process, which is dedicated to communicating with the orchestrating VM, the BOSH Director. The BOSH Agent runs and monitors BOSH jobs on its VM.

Deployments of Windows Server on Operations Manager use a stemcell containing Windows Server 2019.

For more information about obtaining or creating a stemcell for TAS for VMs [Windows], see [Downloading or creating Windows stemcells](#).

## Installing and Configuring TAS for VMs [Windows]

You can install and configure the VMware Tanzu Application Service for VMs [Windows] tile.

The TAS for VMs [Windows] tile installs Windows Diego Cells in your Operations Manager deployment.

The TAS for VMs [Windows] tile inherits settings from the VMware Tanzu Application Service for VMs (TAS for VMs) tile and also includes additional configuration settings.

To install, configure, and deploy TAS for VMs [Windows]:

- In an environment with Internet access:
  1. Complete the prerequisites. See [Prerequisites](#).
  2. Download and install the TAS for VMs [Windows] tile. See [Install the tile](#).
  3. Configure required settings for the tile. See [Configure the tile](#).
  4. Configure resources for the tile. See [Configure tile resources](#).
  5. Upload the Windows stemcell to the tile. See [Upload the stemcell](#).
  6. Deploy the tile. See [Deploy the tile](#).
- In an air-gapped environment, follow the steps in [Install and configure TAS for VMs \[Windows\] in an air-gapped environment](#).

## Prerequisites

Before you install and configure the TAS for VMs [Windows] tile, you must meet the requirements for using the **Windows FS Injector** tool. For more information, see [Windows FS Injector prerequisites](#).

## Windows FS Injector prerequisites

Use the Windows FS Injector tool to install the TAS for VMs [Windows] tile. The Windows FS Injector tool requires:

- The `git` and `tar` executable files must be in your `%PATH%`. If `git` and `tar` are not in your `%PATH%`, either add your `git` and `tar` to the locations in your existing `%PATH%` configuration, or copy the `git.exe` and `tar.exe` executable files to a directory in your `%PATH%`.
- Your installation environment must allow the Windows FS Injector tool access to all of the following URLs:
  - <https://support.broadcom.com/group/ecx/productdownloads?subfamily=Tanzu%20Platform%20for%20Cloud%20Foundry%20Windows> to download the

### Windows FS Injector

- <https://github.com/pivotal-cf/winfs-injector>
- <https://s3.amazonaws.com/>
- <https://registry.hub.docker.com/>
- <https://production.cloudflare.docker.com>
- <https://go.microsoft.com/>
- <https://winlayers.cdn.mscr.io>
- <https://mcr.microsoft.com>
- <https://msecnd.net>, or any domain within the Microsoft Windows Azure Content Delivery Network For more information about the Windows Azure Content Delivery Network, see the [Microsoft documentation](#).

To ensure the authenticity of Microsoft container images, Microsoft does not permit the distribution of its base images. This includes Microsoft container images consumed through Docker Hub, which are delivered by an Microsoft CDN endpoint.

## Installing the TAS for VMs [Windows] tile

To install the TAS for VMs [Windows] tile:

1. Go to [VMware Tanzu Application Service for VMs \[Windows\]](#) on Broadcom Support.
2. Download the **VMware Tanzu Application Service for VMs [Windows]** product file.
3. Download the **Windows FS Injector** tool for your workstation OS. The Injector tool, `winfs-injector`, is an executable binary that adds the Windows Server container base image into the product file. This step requires Internet access and can take up to 20 minutes.



You need the `git` and `tar` executable files in your `%PATH%` to run `winfs-injector.exe`. For example, copy `git.exe` and `tar.exe` to a directory in your `%PATH%`.

4. Add the Windows Server container base image to the product file:

```
winfs-injector ^
--input-tile TASW-DOWNLOAD-PATH ^
--output-tile TASW-IMPORTABLE-PATH
```

Where: \* `TASW-DOWNLOAD-PATH` is the path and filename to the TAS for VMs [Windows] product file you downloaded. \* `TASW-IMPORTABLE-PATH` is the output path for the importable product file. For example:

```
C:\Users\admin> winfs-injector ^
--input-tile c:\temp\pas-windows-2.9.0-build.1.pivotal ^
--output-tile c:\temp\pas-windows-2.9.0-build.1-INJECTED.pivotal
```

This step takes up to 20 minutes to complete.

If you have the `BOSH_ALL_PROXY` environment variable set, this can cause the winfs-injector to fail, with an error similar to this:

```
-- Failed downloading 'golang-1-windows/789a42163ee8b705cfcd8a62e590d5cbf01322c  
773497d6c53247cf6a4e39965' (shal=sha256:55db4fe9804edfff5f01c5cee0d2541333a71f4  
0c905135912c9c22783e038c1)
```

If this happens, reset the `BOSH_ALL_PROXY` environment variable, and then try again.

5. Go to the VMware Tanzu Operations Manager Installation Dashboard and click **Import a Product**.
6. To add the TAS for VMs [Windows] tile to the **Import a Product** product list, select the importable `TASW-IMPORTABLE-PATH` file on your computer.
7. To add the TAS for VMs [Windows] tile to your staging area, click **+** under the **VMware Tanzu Application Service for VMs [Windows]** product listing.

## Configuring the TAS for VMs [Windows] tile

The following sections describe how to configure the settings for the TAS for VMs [Windows] tile.

### Assigning availability zones and networks

In **Assign AZ and Networks**, you assign jobs to your Availability Zones (AZs) and networks.

To configure AZs and networks:

1. Click the TAS for VMs [Windows] tile.
2. Click **Assign AZs and Networks** or **Assign Networks**. The name of the pane varies depending on your IaaS.
3. Select the first AZ under **Place singleton jobs**. Tanzu Operations Manager runs any job with a single instance in this AZ.
4. Select all AZs under **Balance other jobs**. Tanzu Operations Manager balances instances of jobs with more than one instance across the AZs that you specify.



For production deployments, VMware recommends at least three AZs for a highly available installation.

5. From the **Network** drop-down menu, choose the runtime network that you created when you configured the BOSH Director tile.
6. Click **Save**.

### Configuring VMs

In **VM Options**, you configure settings for accessing your VMs.

To configure VM access:

1. Click **VM Options**.
2. In **Administrator passwords**, select one of the following:

- To randomize the admin password, select **Use randomized password**. If you select this option, the admin password is not retrievable by an operator. This is the default selection.
  - To set the same admin password for every Windows Diego Cell, select **Configure a password** and enter a password in the **Password** check box. If you select this option, this is the password for all VMs that are used to access any Windows Diego Cell.
3. (Optional) To start the Microsoft beta port of the OpenSSH daemon on port 22 for all VMs, select the **Access VMs with BOSH SSH (beta)** check box. If you select this option, it allows users to SSH into Windows VMs with the `bosh ssh` command and enter a CMD terminal as an admin user.
  4. (Optional) To configure a Key Management Service (KMS) that your volume-licensed Windows Diego Cell can register with:
    1. Under **KMS**, select **Use**.
    2. In **Hostname**, enter the host name for your KMS server.
    3. In **Port**, enter the port number of your KMS server. The default port number is 1688.
  5. Click **Save**.

## Configuring smoke tests

In **Smoke Tests**, you specify the org and space where smoke tests are run.

In the org and space that you specify, the Smoke Test errand pushes an app to the org. The app runs basic function tests against your TAS for VMs [Windows] deployment after an installation or update.

The Smoke Test errand is turned on by default. You can turn off the Smoke Test errand in the **Errands** pane. For more information about settings for errands, see [Configure errands](#).

For help configuring the smoke tests, see [Configure smoke tests in \*Installing and configuring TAS for VMs \[Windows\]\*](#) in the VMware documentation.

To configure smoke tests:

1. Click **Smoke Tests**.
2. If you have a shared apps domain, select **A temporary space within the system org**. This creates a temporary space in the system org for running smoke tests and deletes the space afterwards. Otherwise, select **Smoke test location** and specify the domain, org, and space. To configure where TAS for VMs [Windows] pushes an app to run smoke tests:
  - In **Org**, enter the org TAS for VMs [Windows] you can use when pushing an app to run smoke tests.
  - In **Space**, enter the space TAS for VMs [Windows] you can use when pushing an app to run smoke tests.
  - In **Apps Domain**, enter the domain TAS for VMs [Windows] you can use when pushing an app to run smoke tests.

## Configuring Advanced Features

The **Advanced Features** screen includes new capability that might have certain constraints. Although these features are fully supported, VMware recommends caution when using them in production environments.

For help filling in these text boxes, see [Advanced Features](#).

The following sections describe how to configure the Advanced Features.

### Diego Cell memory and disk overcommit

Use the overcommit settings if your apps do not use the full allocation of disk space and memory set in **Resource Config**. These settings control the amount to overcommit disk and memory resources to each host VM.

For example, you can use the overcommit if your apps use a small amount of disk and memory capacity compared to the amounts set in the **Resource Config** settings for **Windows Diego Cell**.

Because of the risk of app failure and the deployment specific nature of disk and memory use, VMware has no recommendation for how much, if any, memory or disk space to overcommit.

To enable overcommit:

1. Click **Advanced Features**.
2. In the **Diego Cell memory capacity** text box, enter the value in MB for the total amount of memory to allocate to each Diego Cell. See the **Diego Cell** row in **Resource Config** for the current Diego Cell memory capacity settings that this setting overrides.
3. In the **Diego Cell disk capacity** text box, enter the value in MB, for the total amount of disk to allocate to each Diego Cell. See the **Diego Cell** row in **Resource Config** for the current Diego Cell disk capacity settings that this setting overrides.
4. Click **Save**. Entries made to each of these text boxes set the total amount of resources allocated, not the overage.

### Gorouter app identity verification (beta)

You can choose the method the Gorouter uses to verify app identity. Verifying app identity using TLS or mutual TLS (mTLS) activates encryption between the Gorouter and application containers, and guards against misrouting during control plane failures. This feature is deactivated by default.

For more information about Gorouter route consistency modes, see [Preventing misrouting in HTTP Routing](#).

To configure app identity verification:

1. Select **Advanced Features**.
2. Under **Gorouter app identity verification (beta)**, select one of the following options:
  - **The Gorouter uses TLS to verify app identity**: Activates the Gorouter to verify app identity using TLS. This is the default option.
  - **The Gorouter and apps use mutual TLS to verify each other's identity**
  - **Disallow app identity verification and mutual TLS**: Deactivates app identity verification and mutual TLS. Activates the Gorouter and your apps to verify each other's identity using TLS. Before you turn on this option, consider:
    - This option deactivates TCP routing because application containers accept incoming communication only from the Gorouter.

- If you activate mTLS in the TAS for VMs [Windows] tile, you must also activate mTLS in the **App Containers** pane of the TAS for VMs tile.
- You need v2.3 or later of both TAS for VMs and Isolation Segment. The Gorouter and Diego Cell components in Pivotal Cloud Foundry v2.2 and earlier do not support mTLS handshakes.

3. Click **Save**.

#### Custom Windows Diego Cell overlay subnet

The IP range for the overlay network of your Windows Diego Cell. The default range is `172.30.0.0/22`.

IP address space for container networking. If this conflicts with any internal IP addresses that your organization uses, you can customize this subnet. Unlike in TAS for VMs [Windows] deployments using Linux Diego Cells, you configure this subnet per Diego Cell. When you configure a custom subnet for a Windows Diego Cell, ensure that:

- The CIDR range of your custom subnet does not conflict with any resources that your apps might need to use.
- The subnet is large enough to accommodate the number of apps you expect to have running on each Diego Cell.

To configure a custom Windows Diego Cell overlay subnet:

1. In the TAS for VMs [Windows] tile, click **Advanced Features**.
2. For **Diego Cell overlay subnet**, enter the subnet you want to configure for your Diego Cell.



Setting the subnet too small limits the number of containers that can run on each Windows Diego Cell.

3. Click **Save**.

## Configuring errands

Errands are scripts that Tanzu Operations Manager runs when it installs or uninstalls a product. For example, a new version of TAS for VMs [Windows]. There are two types of errands: *post-deploy errands* run after the product is installed, and *pre-delete errands* run before the product is uninstalled.

By default, Tanzu Operations Manager runs all errands.

In **Errands**, you can change these run rules. For each errand, click **On** to run it each time Tanzu Operations Manager installs or uninstalls a product, or **Off** to never run it.

For more information about how Tanzu Operations Manager manages errands, see [Managing errands in Tanzu Operations Manager](#).

To configure errands:

1. Click **Errands**.
2. To receive the most up-to-date HWC buildpack, set the **Install HWC Buildpack Errand** to **On**.

3. To ensure that a smoke test is run against your TAS for VMs [Windows] installation, set the **Smoke Test Errand to On**.
4. Click **Save**.

This beta feature verifies only that the client certificate is signed by the expected CA using mTLS. It does not include SAN (Subject Alternative Name) verification of the presented client certificates.

## Configuring isolation segments (optional)

To deploy your TAS for VMs [Windows] app workloads to an isolation segment, click **App Containers** and follow the procedure in [Assign a tile to an isolation segment](#) in *Windows Diego Cells in isolation segments*.

## Configure Windows authentication (optional)

To configure Windows Diego Cells to allow application containers to perform Windows authentication, click **Windows Authentication** and follow the procedure in [Configuring the tile for Windows authentication](#) in *Windows authentication for .Net apps*.

Use an isolation segment for Windows Authentication, so that all apps in the TAS for VMs [Windows] installation have access to the GMSA credentials.

## Configuring system logging (optional)

Click **System Logging**:

1. (Optional) To configure Windows Diego Cells to send VM logs to an external syslog server, follow the procedure in [Forwarding logs to a syslog server](#) in *Troubleshooting Windows Diego Cells*.
2. (Optional) For **OpenTelemetry Collector Configuration**, the default value is empty, which deactivates the OpenTelemetry Collector.
  - o To configure TAS for VMs to send logs, metrics, and traces using the OpenTelemetry Collector, enter valid OpenTelemetry Collector YAML configuration in this text box. See [Configuring the OpenTelemetry Collector](#) for examples of how to configure OpenTelemetry Collector. Currently TAS for VMs supports a limited number of OpenTelemetry Collector Exporters and Processors.
  - o To use non-GA exporters and processors from the available options, you must enable experimental features by selecting the **Experimental OpenTelemetry Collector features** checkbox.



### Note

The OpenTelemetry Collector is supported in TAS for VMs [Windows] v6.0.13 and later.



### Caution

If you configure an exporter that listens on a port, ensure that the port is not claimed by a TAS for VMs [Windows] component on any of the VMs in your deployment.



Windows stemcells in the v2019.x line support ephemeral disks.

## Configuring DNS search domains (optional)

To configure DNS search domains for your application containers:

1. Click the VMware Tanzu Application Service for VMs tile in the **Installation dashboard**.
2. Click **Networking** to open the **Networking** pane.
3. In the **DNS search domains** text box, enter DNS search domains as a comma-separated list.
4. Click **Save**.

## Configuring tile resources

In **Resource Config**, you must associate load balancers with the VMs in your deployment to enable traffic.

To configure your tile resources:

1. Click **Resource Config**.
2. Use the drop-down menus to configure the **Windows Diego Cell**. The table shows the recommended Windows Diego Cell disk size for your IaaS:

IaaS	Recommended Windows Diego Cell Disk Size
AWS	100 GB
Azure	150 GB
GCP	150 GB
vSphere	100 GB



Windows stemcells in the v2019.x line support ephemeral disks.

3. Provision your **Master Compilation Job** with at least 100 GB of disk space.
4. Click **Save**.

## Uploading the stemcell

After you configure resources for the TAS for VMs [Windows] tile, you must upload the Windows stemcell to the tile.

To upload the stemcell:

1. In the TAS for VMs [Windows] tile, click **Stemcell Library**.
2. Retrieve the stemcell that you downloaded or created in [Downloading or creating a Windows stemcell](#).
3. Follow the procedure in [Importing and managing stemcells](#) to upload the Windows stemcell to TAS for VMs [Windows].



If you use vSphere, you must create your own stemcell. The default root disk size of Windows stemcells v2019.x line is 30 GB.

VMware recommends setting the root disk size of your Windows stemcell for vSphere to 30 GB. For more information, see [Creating a Windows stemcell for vSphere using stembuild](#).

## Deploying the tile

After uploading the Windows stemcell to the TAS for VMs [Windows] tile, you are ready to deploy the tile.

To deploy the TAS for VMs [Windows] tile:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click **Review Pending Changes**.
3. Click the TAS for VMs [Windows] tile and review the changes. For more information, see [Reviewing pending product changes](#).
4. Click **Apply Changes**.

## Creating more tiles (optional)

To run Windows Diego Cells in multiple isolation segments, you must create and configure additional TAS for VMs [Windows] tiles. For more information, see [Windows Diego Cells in isolation segments](#).

## Install and configure TAS for VMs [Windows] in an air-gapped environment

To install, configure, and deploy TAS for VMs [Windows] in an air-gapped environment:

1. Follow the steps in [Prepare a Windows rootfs image in a private registry](#).
2. Follow the steps in [Install the tile](#) with the following exceptions:
  - o To add the Windows Server container base image to the product file, replace the Internet-enabled `winfs-injector` command line earlier in this procedure with the `winfs-injector` procedure in [Add the Windows Server container base image to the product file](#).
3. Configure required settings for the tile. See [Configure the tile](#).
4. Configure resources for the tile. See [Configure tile resources](#).
5. Upload the Windows stemcell to the tile. See [Upload the stemcell](#).
6. Deploy the tile. See [Deploy the tile](#).

## Preparing a Windows rootfs image in a private registry

To create a TAS for VMs [Windows] tile, a windows file system container image is typically fetched from a Docker registry. An administrator can fetch the windows file system image from either [cloudfoundry/windows2016fs](#) the publicly hosted Docker Hub repository, or a privately hosted container image registry.

To prepare a windows file system container image in a private registry:

1. Create an accessible Windows Server 2019 machine in your environment.
2. Install Docker on this Windows Server 2019 machine.
3. Configure this Windows machine's Docker daemon to allow non-redistributable artifacts to be pushed to your private registry. For information about configuring your Docker daemon, see the [Docker documentation](#).
4. Open a command line on the Windows machine.
5. To download the windows file system container image, run:

```
docker pull cloudfoundry/windows2016fs:2019
```

6. To tag the Windows container image, run:

```
docker tag cloudfoundry/windows2016fs:2019 REGISTRY-ROOT/cloudfoundry/windows2016fs:2019
```

Where `REGISTRY-ROOT` is your private registry's URI.

7. To upload the Windows Container image to your accessible private registry, run:

```
docker push IMAGE-URI
```

Where `IMAGE-URI` is the URI to the Windows rootfs image in your private registry. Your image URI follows the pattern:

`my.private.registry/cloudfoundry/windows2016fs:2019`.

## Add the Windows Server container base image to the product file

To add the Windows Server container base image to the product file in an air-gapped environment, run:

```
winfs-injector ^
--input-tile TASW-DOWNLOAD-PATH ^
--output-tile TASW-IMPORTABLE-PATH ^
--registry TASW-REGISTRY-URI
```

Where:

- `TASW-DOWNLOAD-PATH` is the path and filename to the TASW product file you downloaded.
- `TASW-IMPORTABLE-PATH` is the output path for the importable product file.
- `TASW-REGISTRY-URI` is the uri to the container image registry hosting your `cloudfoundry/windows2016fs` image.

For example:

```
C:\Users\admin> winfs-injector ^
--input-tile c:\temp\pas-windows-2.6.0-build.1.pivot ^
--output-tile c:\temp\pas-windows-2.6.0-build.1-INJECTED.pivot ^
--registry https://my.registry.com
```

For information about troubleshooting `wifns-injector`, see [Missing local certificates for Windows FS Injector in Troubleshooting Windows Diego Cells](#).

## Downloading or creating Windows stemcells in Cloud Foundry

You can download or create the stemcells that VMware Tanzu Application Service for VMs [Windows] needs for creating VMs on your infrastructure.



Traffic is not encrypted with TLS between Gorouter and Windows stemcells.

## Windows stemcells

A BOSH stemcell is a versioned OS image wrapped with IaaS specific packaging. BOSH uses a stemcell to supply the basic OS for any Windows VM it creates. A typical BOSH stemcell for Windows contains:

- A bare minimum Windows OS skeleton
- A BOSH agent
- OS configuration files and common utilities

For more information about stemcells, see the [BOSH documentation](#) in the Cloud Foundry BOSH documentation.

## Windows stemcell compatibility

Check the compatibility details before deploying and installing the TAS for VMs [Windows] tile. See [Stemcells \(Windows\)](#) on Broadcom Support.



Windows Stemcell v2019.79 has been removed from Broadcom Support because of an incompatibility found in the Windows Updates included and the `winc` component used in the Tanzu Platform for Cloud Foundry Windows. This issue has been fixed in TAS for VMs [Windows] v6.0.11. For details, see [Tanzu Platform for Cloud Foundry on Windows - Nov 2024 Stemcell \(2019.79\) Issue Causing Stuck/Hung BOSH Deployments on Windows Diego Cells](#) in the Broadcom Support KB.

Depending on your IaaS, you can create or download a stemcell using the following methods:

- **Azure:** To activate and download the Azure Windows Stemcell, see [Configuring the Azure Light Stemcell](#).
- **Google Cloud Platform (GCP):** Download the [GCP light Stemcell for Windows 2019 Server](#) from the [Stemcells \(Windows\)](#) page on Broadcom Support.
- **vSphere:** To create a stemcell, see [Creating a Windows Stemcell for vSphere using stembuild](#).
- **Amazon Web Services (AWS):** Download the [AWS light Stemcell for Windows 2019 Server](#) from the [Stemcells \(Windows\)](#) page on Broadcom Support.

## Configuring the Azure Light Stemcell

On Azure, the stemcell is offered in the Azure Marketplace.

To start using the Azure Light Stemcell:

- [Enabling the Azure Light Stemcell](#)
- [Downloading the Azure Light Stemcell](#)

## Activating the Azure Light Stemcell

To use the Azure Light Stemcell, you must first accept the corresponding Microsoft license agreement, and enable the stemcell for your non-trial Azure Subscription through the Azure Marketplace.

## Activating Azure subscriptions

To activate the Azure subscriptions that you want your stemcell to use:

1. Go to the [Microsoft Azure portal](#) and log in.
2. From the options on the left pane, click **+ Create a resource**.
3. In **Search the Marketplace**, search for **BOSH Stemcell for Windows Server 2019**.
4. Select **BOSH Stemcell for Windows Server 2019** from your search results. A description of the Azure stemcell appears.
5. Click the blue banner that reads **Want to deploy programmatically? Get started**.
6. Review the Terms of Use on the **Configure Programmatic Deployment** page that appears.
7. Under **Choose the subscriptions**, click **Enable** for each Azure subscription with which you want to use the stemcell.
8. Click **Save**.

## Accepting the license agreement

To accept the license agreement for your stemcell:

1. Log in to Azure with the Azure CLI, using this command:

```
az login
```

2. To list the available Windows stemcells and find latest Windows stemcell [urn](#), run this Azure CLI command:

```
az vm image list --all --publisher pivotal --sku 2019
```

For example:

```
az vm image list --all --publisher pivotal --sku 2019
Offer          Publisher      Sku      Urn
Version
-----
bosh-windows-server-2019  pivotal      2019      pivotal:bosh-windows-server-2019:2019.1.050001  2019.1.050001
```

```
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.2.022001 2019.2.022001
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.3.041001 2019.3.041001
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.4.044001 2019.4.044001
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.5.006001 2019.5.006001
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.6.025001 2019.6.025001
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.7.012001 2019.7.012001
bosh-windows-server-2019 pivotal 2019 pivotal:bosh-windows-server-2019:2019.8.028001 2019.8.028001
```

In the previous example, `pivotal:bosh-windows-server-2019:2019.8.028001` is the latest Windows stemcell `urn`.

- To accept the terms for the selected Windows stemcell for each Azure subscription you want to use for the stemcell, run this command:

```
az vm image accept-terms --subscription SUBSCRIPTION_ID --urn URN-ID
```

Where:

- `SUBSCRIPTION_ID` is an Azure subscription with which you want to use the stemcell.
- `URN-ID` is the `urn` for the latest Windows stemcell.

## Downloading the Azure Light Stemcell

To download the Azure Light Stemcell for use in VMware Tanzu Operations Manager:

- Go to the [Stemcells \(Windows\)](#) page on Broadcom Support.
- Download the **Azure Light Stemcell for Windows 2019 Server**.

For information about how to deploy and configure the TAS for VMs [Windows] tile, see [Installing and configuring TAS for VMs \[Windows\]](#).

## Creating a Windows stemcell for vSphere using stembuild

A BOSH stemcell is a versioned operating system image.

You must create a BOSH stemcell for Windows before you can deploy these products on vSphere:

- VMware Tanzu Application Service for VMs [Windows] (TAS for VMs [Windows])
- VMware Tanzu Kubernetes Grid Integrated Edition (TKGI) with Windows workers in Kubernetes clusters

To create a Windows stemcell for vSphere, you create a base Windows VM from a volume licensed ISO and subsequently maintain that base template with all Windows-recommended security updates, but without the BOSH dependencies.

The Windows VM with security updates serves as the base for all future stemcells produced from clones of that base VM. This enables you to build new stemcells without having to run Windows updates from the beginning each time. You can also use a “snapshot” feature to maintain an updated Windows image that does not contain the BOSH dependencies.

VMware recommends installing any available updates and then rebuilding the stemcell from a clone of the original VM.

The BOSH stemcell that you create in this topic is based on Windows Server 2019. If you already have a BOSH stemcell for Windows on vSphere, see [Monthly stemcell upgrades](#).

For more information, see [Best Practices for Stembuild for Tanzu Application Service & Tanzu Kubernetes Grid Integrated Edition](#) in *VMware Tanzu Tech Tutorials*.

## Stembuild overview

Stembuild is a binary that you use to build BOSH stemcells for Windows Server 2019.

Stembuild creates a BOSH stemcell from a base Windows image. The stembuild CLI has two commands, construct and package, which you run against a Windows Server 2019 VM. [Step 4: Construct the BOSH stemcell](#) and [Step 5: Package the BOSH stemcell](#) as follows explain how to run these commands.

Before using stembuild to create a stemcell, you must create a Windows Server 2019 VM and update the VM with the latest Windows updates. [Step 1: Create a base VM for the BOSH stemcell](#), [Step 2: Configure the base VM](#), and [Step 3: Clone the base VM](#) explain how to prepare the Windows Server 2019 VM.

## Prerequisites

Before you create a BOSH stemcell for Windows on vSphere, you must have:

- A vSphere environment that makes sure the VM hardware used by the stemcell is compatible with your deployment environment’s ESXi/ESX host, and vCenter Server versions. For more information about the vSphere environment, see [ESXi/ESX hosts and compatible virtual machine hardware versions list \(2007240\)](#) in the Broadcom Support Knowledge Base.
- An ISO for a Windows Server 2019 Server Core installation, build number: 17763, from [Microsoft Developer Network \(MSDN\)](#) or [Microsoft Volume Licensing Service Center \(VLSC\)](#). The Windows Server 2019 ISO must be a clean, base ISO file. You can use an evaluation copy for testing, but VMware discourages an evaluation copy for production, because the licensing expires. For more information, see the [Windows Server documentation](#) or the [Microsoft Volume Licensing Service Center](#) website.

A clean ISO file has no custom scripts or tooling. For example, the ISO must have no logging or antivirus tools installed.

- A download of the `stembuild` command line interface (CLI) from a 2019.x release in [Stemcells \(Windows\)](#) on Broadcom Support.
  - To build a Windows stemcell for TAS for VMs [Windows], use the vSphere `stembuild` CLI for Windows corresponding to both the operating system of your local host and the stemcell version that you want to build.
  - To build a Windows stemcell for TKGI, use a Windows stemcell and `stembuild` CLI version listed as compatible in the **Product Snapshot** table in the release notes for your

TKGI version: [Release Notes](#)

- Microsoft [Local Group Policy Object Utility \(LGPO\)](#) downloaded to the same folder as your `stembuild` CLI.
- The minimum vCenter user permissions required to use `stembuild` for vSphere stemcells, specifically:
  - `VirtualMachine.GuestOperations.Modify`
  - `VirtualMachine.GuestOperations.Execute`
  - `VirtualMachine.GuestOperations.Query`
  - `VirtualMachine.Config.AddRemoveDevice`
  - `VirtualMachine.Interact.SetCDMedia`
  - `VApp.Export`
  - `System.Anonymous*`
  - `System.Read*`
  - `System.View*`

Permissions designated with an `*` are generated when you create a new user in vCenter and cannot be set within the vCenter UI.

## Step 1: Create a base VM for the BOSH stemcell

Learn how to create, configure, and verify a base VM for Windows from a volume licensed ISO.

### Upload the Windows Server 2019 ISO



The instructions in this topic are based on vSphere v6.0.

To upload the Windows Server 2019 ISO to vSphere:

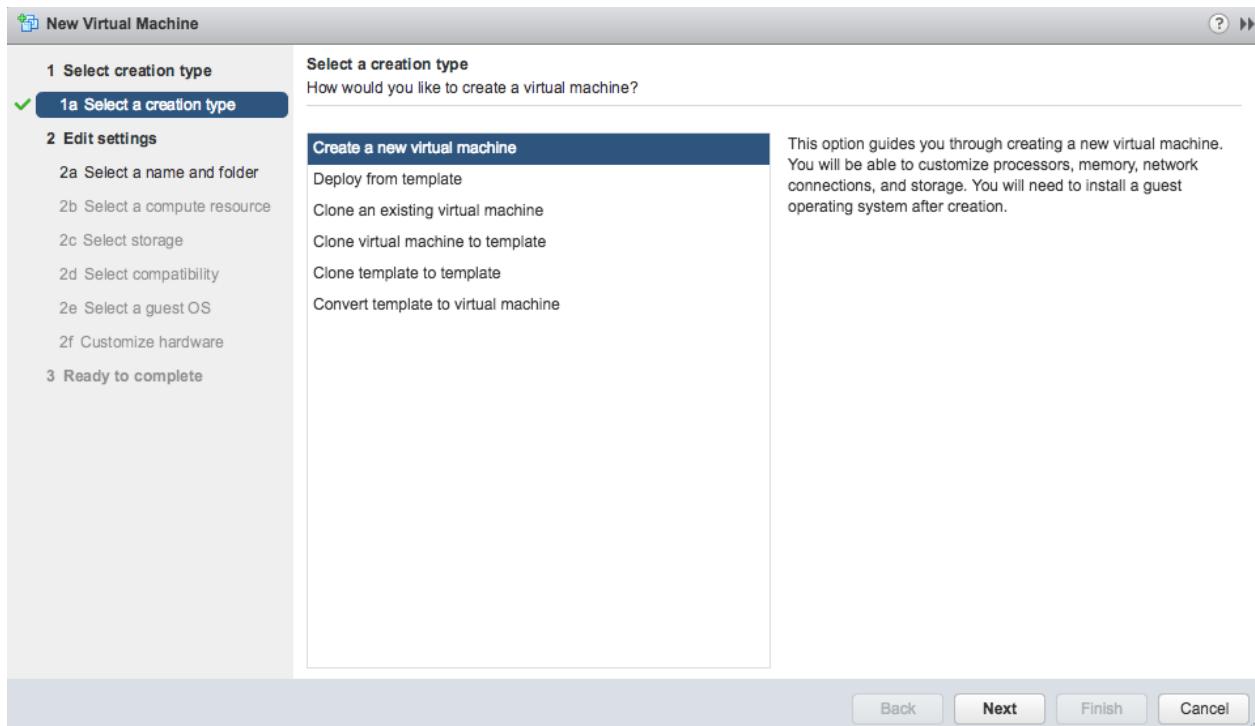
1. Log in to the vSphere Web Client.
2. Click **Storage** and select a datastore.
3. Select or create a folder in which to upload the Windows Server 2019 ISO.
4. Click **Upload a File** and select the Windows Server 2019 ISO.

You can use the `scp` utility instead of the vSphere Web Client to copy the file directly to the datastore server.

### Create and customize a base VM

To create and customize a base VM:

1. In the vSphere Web Client, click the **VMs and Templates** view to display the inventory objects.
2. Right-click an object and click **New Virtual Machine**, then **New Virtual Machine**.
3. On the **Select a creation type** page, click **Create a new virtual machine** and click **Next**.



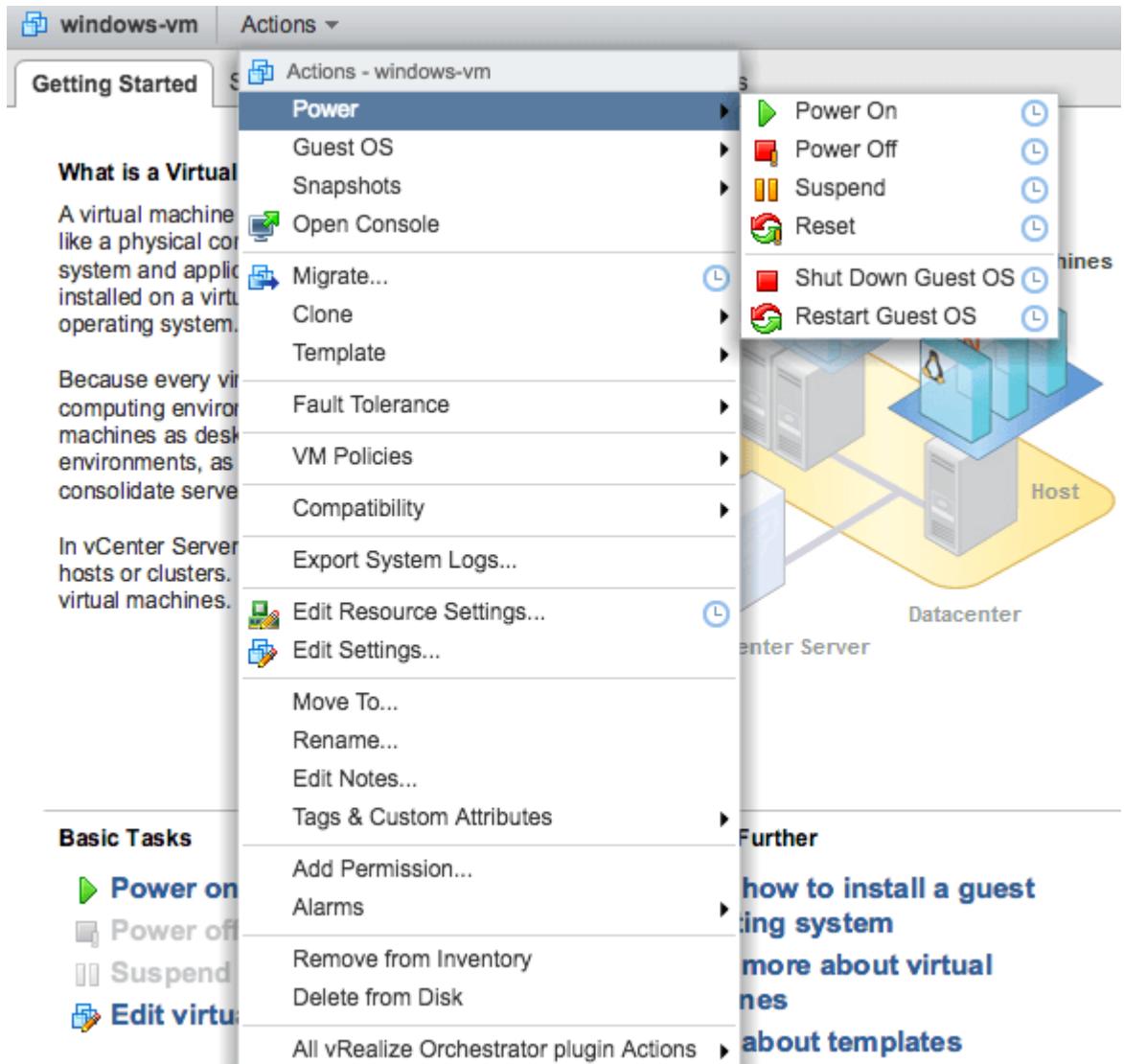
1. On the **Select a name and folder** page:
  1. Enter a name for the VM.
  2. Select a location for the VM.
2. Click **Next**.
3. On the **Select a compute resource** page, select a compute resource to run the VM and click **Next**.
4. On the **Select storage** page:
  5. Select a **VM Storage Policy**.
  6. Select the destination datastore for the VM configuration files and virtual disks.
7. Click **Next**.
8. On the **Select compatibility** page, for the **Compatible with** configuration setting, select **ESXi 6.0 and later** and click **Next**.
9. On the **Select a guest OS** page:
  10. For **Guest OS Family**, select **Windows**.
  11. For **Guest OS Version**, select **Microsoft Windows Server 2019**. If **Microsoft Windows Server 2019** is not available, select **Microsoft Windows Server 2016**.
12. Click **Next**.
13. On the **Customize hardware** page, configure the VM hardware using the information as follows and click **Next**.
  14. For **New Hard disk**, specify 30 GB or greater.
  15. For **New CD\DVD Drive**:
    1. Click **Datastore ISO File**.
    2. Select the Windows Server 2019 ISO file you uploaded to your datastore and click **OK**.

3. Click the **Connect at Power On** check box.
16. Review the configuration settings on the **Ready to complete** page, and click **Finish**.

## Installation of Windows Server

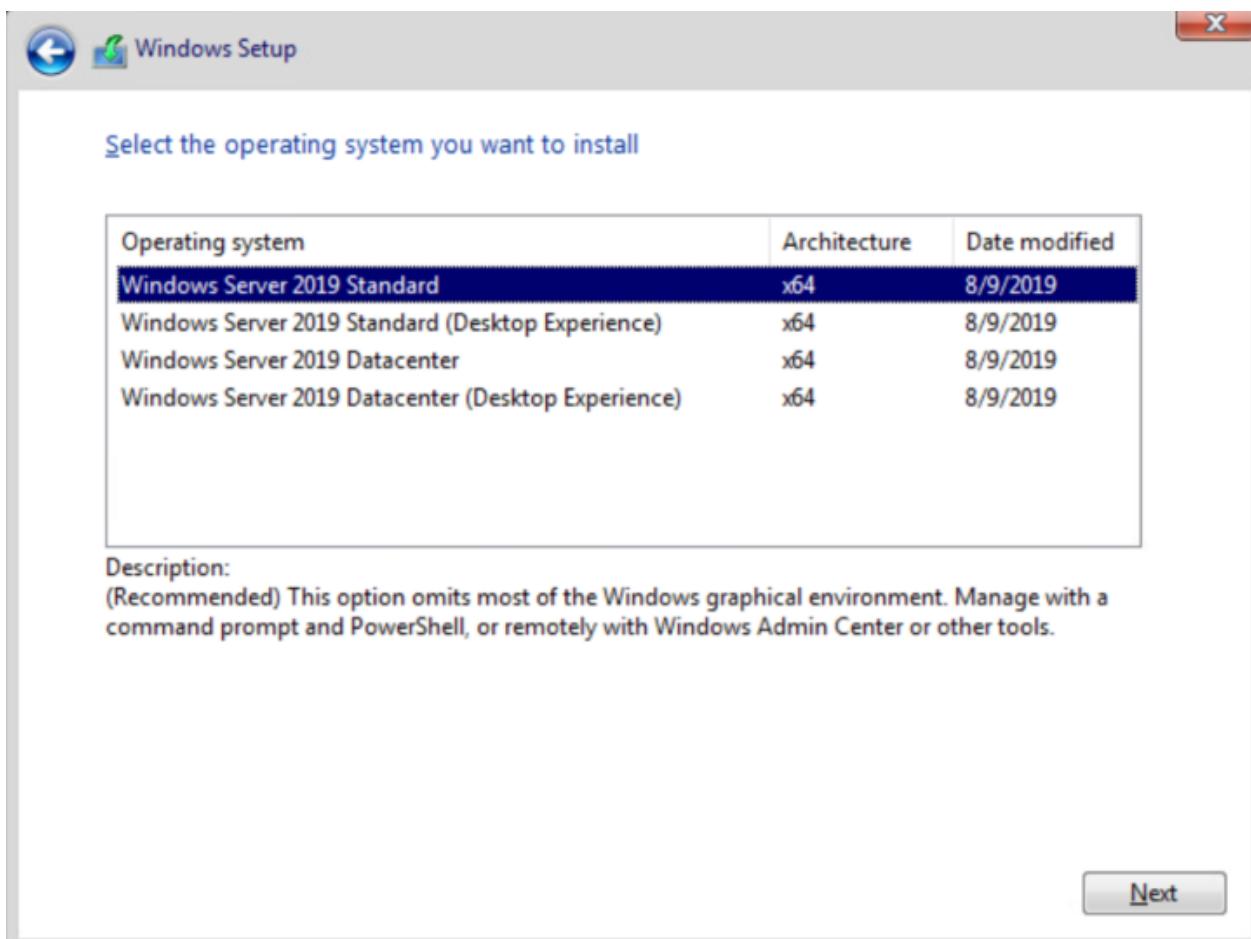
To install Windows Server on the base VM:

1. After creating the VM, in the **Actions** tab for your VM, click **Power**, then click **Power On**.



The screenshot shows the vCenter Server interface for managing a virtual machine named "windows-vm". The "Actions" tab is selected. Under the "Power" section of the dropdown menu, the "Power On" option is highlighted. Other options include Power Off, Suspend, Reset, Shut Down Guest OS, and Restart Guest OS. To the right of the menu, there is a 3D-style diagram illustrating a datacenter environment with multiple hosts and a central management node labeled "Host" and "Datacenter".

1. Click **Windows Server 2019 Standard**.



1. Click **Custom installation**.
2. Complete the installation and enter a password for the administrator user.

## Verifying the operating system

To verify that you are using the correct OS version, run this PowerShell command on the base VM:

```
[System.Environment]::OSVersion.Version
```

The output displays:

```
[System.Environment]::OSVersion.Version
Major   Minor   Build   Revision
----   ----   -----   -----
10       0       17763     0
```

## Installing VMware tools

To install VMware Tools on the base VM:

1. In the vSphere Web Client, right-click the base VM and select **Guest OS**, then **Install VMware Tools**.
2. Click **Mount**.
3. Log in to the VM.

4. Go to the **D:** drive.
5. To install the VMware Tools, run:

```
setup64.exe
```

6. Wait for a pop-up window.



The VMware Tools install window might appear behind the CLI window. To avoid this, shrink or minimize the CLI window while you are waiting.

7. When prompted, follow the instructions to finish the installation.
8. To complete the installation, start the VM again.

## Step 2: Configuring the base VM

Install all the Windows Server updates so that you have the latest, most secure, version of the Windows Server operating system.

To configure the base VM network settings and install Windows updates:

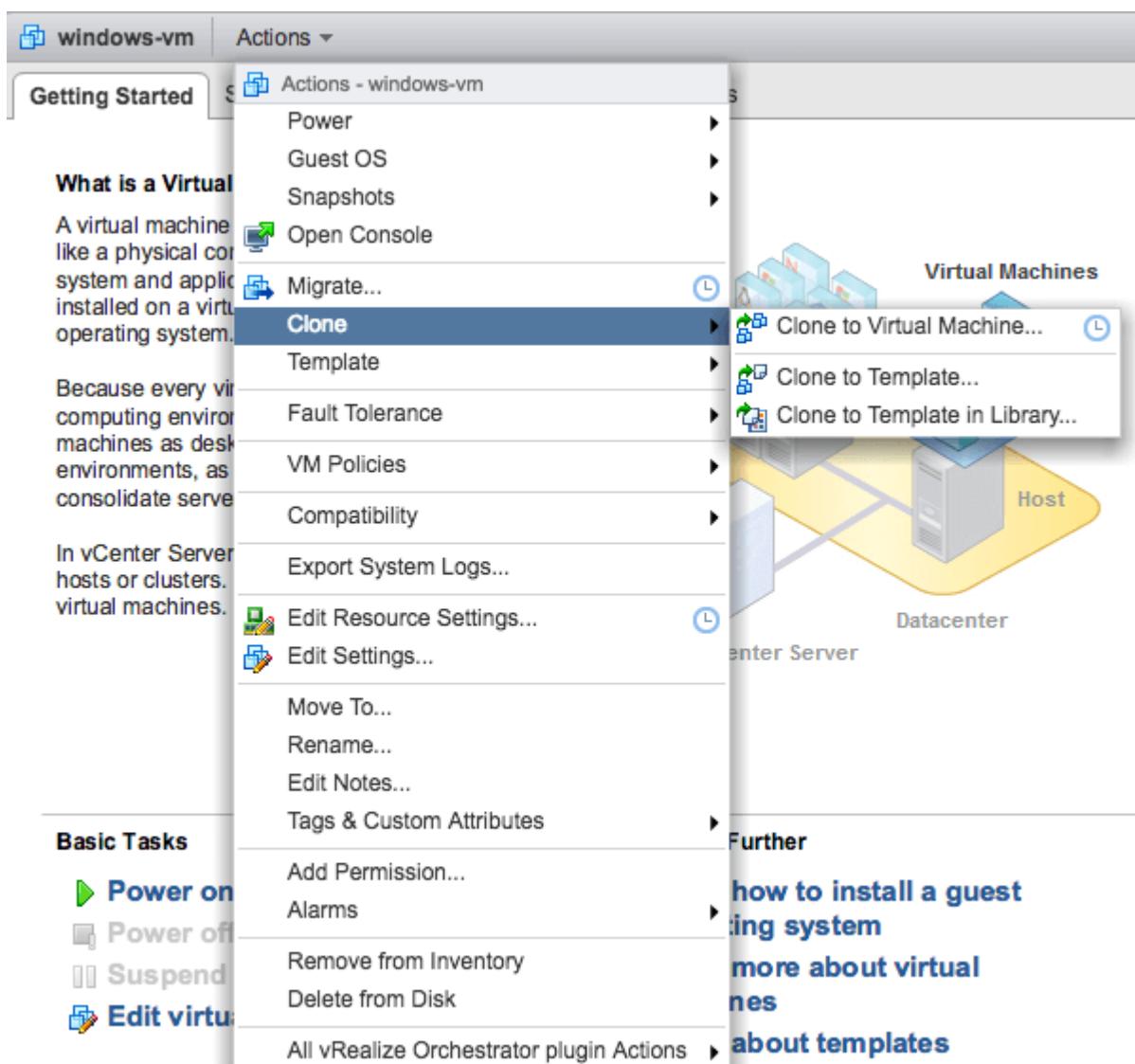
1. From the vSphere Web Client, right-click the base VM and select **Open Remote Console**.
2. On the command line, enter `sconfig` to run the **SConfig** utility.
3. On the **Server Configuration** page, in **Network Settings**, enter **8**.
4. On the **Network Settings** pane:
  1. Under **Available Network Adapters**, enter the number that corresponds to your network adapter.
  2. Enter **1** to set the network adapter address.
  3. Enter **S** to set a static IP address.
  4. Enter a static IP address.
  5. Enter a subnet mask or leave the text box empty to use the default value.
  6. Enter the default gateway.
  7. Enter **2** to set a DNS server.
  8. Enter a DNS server and click **OK** on the resulting message box.
  9. (Optional) Enter a secondary DNS server.
  10. Enter **4** to return to the main menu.
5. On the **Server Configuration** page, in **Download and Install Updates**, enter **6**.
6. Enter **A** to search for all updates.
7. For **Select an option**, enter **A** to install all updates. You might need to restart the base VM while installing the updates, if so run **Download and Install Updates** again after reboot until no more updates are found.

8. On the vSphere Web Client, click **Actions**, then click **Edit Settings** on the VM.
9. In the **CD/DVD drive 1** row deselect the **Connected** check box. Do not remove the CD/DVD drive.
10. Restart the VM.
11. After the VM restarts verify that you can ping the IP address you assigned to the base VM.

## Step 3: Clone the base VM

To clone the base VM:

1. From the vSphere Web Client, power off the base VM. This is important because your base VM and the clone VM you create share the same IP address.
2. Right-click the base VM.
3. Click **Clone**, then click **Clone to Virtual Machine**. This clone is your target VM.



1. Save the base VM. You run Windows updates on this VM for future stemcells.
2. Take snapshots of both your base and target VMs. If there is an issue when you run stembuild, use these snapshots to revert to a clean state. For more information, see [Managing snapshots in vSphere Web Client](#) in the *Broadcom Support Knowledge Base*.

- To start the target VM, click **Power > Power On** in the **Actions** tab for your VM.

## Step 4: Constructing the BOSH stemcell

To create your BOSH stemcell, follow these steps:

- If you are running `govc`, a CLI for vSphere operations, unset any `GOVC_` environment variables before you run `stembuild construct`.

For each of the following environment variables, run `echo $GOVC_VAR` to record the current setting, and then run `export GOVC_VAR=` to temporarily unset it:

- `GOVC_USERNAME`
- `GOVC_INSECURE`
- `GOVC_PASSWORD`
- `GOVC_URL`

**Explanation:** Local `GOVC` parameters that are set to configure `govc` take precedence over command-line parameters that `stembuild construct` passes in to `govc`, which can cause `stembuild construct` to fail.

- Collect the following information from the vCenter Web Client **Inventory > VMs and Templates** tab:

- Target VM IP address
- Target VM user name
- Target VM password
- vCenter inventory path to the target VM in the `/YOUR-DATA-CENTER/vm/YOUR-FOLDER/YOUR-VM` format, where:
  - `YOUR-DATA-CENTER` is the name of the data center.
  - `vm` is a static string.
  - `YOUR-FOLDER` is the name of the folder that contains the VM. If the target VM is not in a folder, use the `/YOUR-DATA-CENTER/vm/YOUR-VM` format instead.
  - `YOUR-VM` is the name of the target VM.
- vCenter use name
- vCenter password
- vCenter URL

The target VM must be routable from your local host. Before you run the `construct` command, you must be logged out of the target VM.

- To construct the BOSH stemcell, run this command from the folder where you downloaded the CLI:

```
./STEMBUILD-BINARY construct ^
-vm-ip 'TARGET-VM-IP' ^
-vm-username TARGET-USERNAME ^
-vm-password 'TARGET-VM-PASSWORD' ^
-vcenter-url VCENTER-URL ^
-vcenter-username VCENTER-USERNAME ^
```

```
-vcenter-password 'VCENTER-PASSWORD' ^
-vm-inventory-path 'INVENTORY-PATH' ^
-vcenter-ca-certs 'CUSTOM-CERTS-PATH'
```

Where:

- **STEMBUILD-BINARY** is the `stembuild` file for the version of your local host operating system and the version of the stemcell that you want to build. For example, `stembuild-windows-2019-2`.
- **TARGET-VM-IP** is the IP address of your target VM.
- **TARGET-USERNAME** is the user name of an account with administrator privileges.
- **TARGET-VM-PASSWORD** is the password for the administrator account. The password must be enclosed in single quotes.
- **VCENTER-URL** is the URL of your vCenter.
- **VCENTER-USERNAME** is the user name of your account in vCenter.
- **VCENTER-PASSWORD** is your password. The password must be enclosed in single quotes.
- **INVENTORY-PATH** is the vCenter inventory path to the target VM.
- **CUSTOM-CERTS-PATH** is the file path to custom CA certificates for the destination vCenter. The `-vcenter-ca-certs` flag is optional.

For more information, see [Authenticate into a destination vCenter using CA certificates](#) as follows.

For example:

```
./STEMBUILD-BINARY construct -vm-ip '192.0.2.254' -vm-username user001
-vm-password 'P1a2s3Sword5' -vcenter-url example.com -vcenter-username
user002 -vcenter-password 'P1a2s3Sword5' -vm-inventory-path '/datacenter/vm/folder/test-vm'
2020-01-29T08:52:26.4523812-08:00 Successfully created stemcell version
file.
Finished executing setup script.
WinRM has been disconnected so the VM can reboot. Preparing the VM to b
e shutdown.
2020-01-29T16:53:27.505532+00:00 Still preparing VM...
2020-01-29T16:54:27.94085+00:00 Still preparing VM...
2020-01-29T16:55:28.374568+00:00 Still preparing VM...
Stembuild construct has finished running and the VM has now been shutdo
wn. Run 'stembuild package' to finish building the stemcell.
```



Your `stembuild construct` operation can take up to an hour to complete. Although the WinRM connection stops during `construct` processing, `construct` is still running. Do not attempt to run the `construct` command again.

This example shows the messages that appear as `stembuild construct` runs:

```
2020-01-01T00:00:00 Successfully created stemcell version file.
Finished executing setup script.
```

```
WinRM has been disconnected so the VM can reboot. Preparing the VM to be shutdown.
2020-01-01T00:01:00 Still preparing VM...
2020-01-01T00:02:00 Still preparing VM...
2020-01-01T00:03:00 Still preparing VM...
Stembuild construct has finished running and the VM has now been shutdown. Run 'stembuild package' to finish building the stemcell.
```

8. (Optional) To monitor the status of your `construct` job:

1. Log in to the target VM.
2. Start PowerShell.
3. Run:

```
Get-Content -Path "C:\provision\log.log" -Wait
```

9. Restore the values of any `govc` variables you unset previously.

For more information about `stembuild construct`, see [stembuild construct](#) in the Cloud Foundry stembuild GitHub repository.

## Step 5: Packaging the BOSH stemcell

To package the BOSH stemcell:

1. Gather the vCenter Web Client **VMs and Templates** information that you recorded earlier in the procedure:
  - vCenter inventory path to the target VM in the `/YOUR-DATA-CENTER/vm/YOUR-FOLDER/YOUR-VM` format, where:
    - `YOUR-DATA-CENTER` is the name of the data center.
    - `vm` is a static string.
    - `YOUR-FOLDER` is the name of the folder that contains the VM. If the target VM is not in a folder, use the `/YOUR-DATA-CENTER/vm/MY-VM` format instead.
    - `YOUR-VM` is the name of the target VM.
  - vCenter user name
  - vCenter password
  - vCenter URL
2. Stop the VM. If you do not stop the VM before you continue to the next step, the package command fails, and states that the storage location for the VM cannot be read.
3. To package the BOSH stemcell, run this PowerShell command from your local host:

```
./STEMBUILD-BINARY package ^
-vcenter-url VCENTER-URL ^
-vcenter-username VCENTER-USERNAME ^
-vcenter-password VCENTER-PASSWORD ^
-patch-version PATCH-VERSION ^
```

```
-vm-inventory-path 'INVENTORY-PATH' ^  
-vcenter-ca-certs 'CUSTOM-CERTS-PATH'
```

Where:

- **STEMBUILD-BINARY** is the `stembuild` file for the version of your local host operating system and the version of the stemcell that you want to build. For example, `stembuild-windows-2019-2`.
- **VCENTER-URL** is the URL of your vCenter.
- **VCENTER-USERNAME** is the user name of your account in vCenter.
- **VCENTER-PASSWORD** is your password. The password must be enclosed in single quotes.
- **PATCH-VERSION** is the patch version for the stemcell being built.
- **PATCH-VERSION** is an unquoted version name, for example, `2019.12.3`, or a quoted patch number, for example, `"3"`.
- **INVENTORY-PATH** is the vCenter inventory path to the target VM.
- **CUSTOM-CERTS-PATH** is the file path to custom CA certificates for the destination vCenter. The `-vcenter-ca-certs` flag is optional. For more information, see [Authenticate into a destination vCenter using CA certificates](#).

This command creates a stemcell on your local host in the folder where you ran the command and can take up to 30-minutes to complete.

For more information about `stembuild` package, see [stembuild package](#) in the Cloud Foundry stembuild GitHub repository.

## Step 6: Uploading the BOSH stemcell to Operations Manager

To upload the BOSH stemcell to Tanzu Operations Manager:

1. In Tanzu Operations Manager, go to [Stemcell Library](#).
2. Upload your BOSH stemcell.
3. Deploy the TAS for VMs [Windows] or TKGI tile.

For more information about `stembuild`, see [Stembuild](#) in the Cloud Foundry stembuild GitHub repository.

## Monthly stemcell upgrades

After Microsoft Corporation releases operating system updates, you can upgrade your BOSH stemcell.

To upgrade your BOSH stemcell:

1. [Install Windows updates](#) on the base VM.
2. [Clone the base VM](#).
3. [Construct the BOSH stemcell](#).

4. Package the BOSH stemcell.
5. Replace the existing stemcell in the Tanzu Operations Manager stemcell library with this new stemcell.
6. Deploy the TAS for VMs [Windows] or TKGI tile.

## Known issues

### Authentication error with special characters in stembuild commands

#### Symptom

You authenticate with vCenter and see this error:

```
./out/stembuild: ServerFaultCode: Cannot complete login due to an incorrect user name or password.
vcenter_client - unable to validate url: vcenter.example.com
```

#### Explanation

`stembuild` uses govc libraries. These libraries cannot parse the special characters `/`, `#`, and `:`. This causes errors when authenticating with vCenter.

You might also experience this issue on Windows if your password includes a single quote character, `'`. This also affects the Inventory path if it contains a single quote or a space.

#### Workaround

If your vCenter user name or password contains `/`, `#`, or `:`, or `'` on Windows, set these environment variables:

- For Linux:

```
export GOVC_USERNAME=VCENTER-USERNAME
export GOVC_PASSWORD=VCENTER-PASSWORD
```

- For Windows:

```
set GOVC_USERNAME=VCENTER-USERNAME
set GOVC_PASSWORD=VCENTER-PASSWORD
set GOVC_PATH=VCENTER-INVENTORY-PATH
```

Where:

- `VCENTER-USERNAME` is your vCenter account user name. For example, `johndoe`.
- `VCENTER-PASSWORD` is your vCenter account password. For example, `pass#word`.
- `VCENTER-INVENTORY-PATH` is the location of your VM in the cluster inventory.

If you use other special characters, add single quotes around the input parameters, or set them in an environment variable.

For example:

- For Linux:

```
./STEMBUILD-BINARY package \
-vcenter-url VCENTER-URL \
-vcenter-username 'admin@' \
-vcenter-password VCENTER-PASSWORD \
-patch-version PATCH-VERSION \
-vm-inventory-path 'INVENTORY-PATH' \
-vcenter-ca-certs 'CUSTOM-CERTS-PATH'
```

Where:

- **STEMBUILD-BINARY** is the `stembuild` file for the version of your local host operating system and the version of the stemcell that you want to build. For example, `stembuild-windows-2019-2`.
- **VCENTER-URL** is the URL of your vCenter.
- **VCENTER-PASSWORD** is your password. The password must be enclosed in single quotes.
- **PATCH-VERSION** is the patch version for the stemcell being built.
- **PATCH-VERSION** is an unquoted version name, for example, `2019.12.3`, or a quoted patch number, for example, `"3"`.
- **INVENTORY-PATH** is the vCenter inventory path to the target VM.
- **CUSTOM-CERTS-PATH** is the file path to custom CA certificates for the destination vCenter. The `-vcenter-ca-certs` flag is optional. For more information, see [Authenticate into a destination vCenter using CA certificates](#).
- **For Windows:**

```
set GOVC_PASSWORD=VCENTER-PASSWORD
./STEMBUILD-BINARY package ^
-vcenter-url VCENTER-URL ^
-vcenter-username %GOVC_USERNAME% ^
-vcenter-password %GOVC_PASSWORD% ^
-patch-version PATCH-VERSION ^
-vm-inventory-path %GOVC_PATH% ^
-vcenter-ca-certs 'CUSTOM-CERTS-PATH'
```

Where:

- **VCENTER-PASSWORD** is your vCenter account password. For example, `A_Strange!PAssword@Here#1`.
- **STEMBUILD-BINARY** is the `stembuild` file for the version of your local host operating system and the version of the stemcell that you want to build. For example, `stembuild-windows-2019-2`.
- **VCENTER-URL** is the URL of your vCenter.
- **PATCH-VERSION** is the patch version for the stemcell being built. **PATCH-VERSION** is specified as an unquoted version name, for example, `2019.12.3`, or as a quoted patch number, for example, `"3"`.
- **CUSTOM-CERTS-PATH** is the file path to custom CA certificates for the destination vCenter. The `-vcenter-ca-certs` flag is optional. For more information, see [Authenticate into a](#)

destination vCenter using CA certificates.

Windows environment variables do not automatically override vCenter command line parameters, so you must specify the environment variables in the vCenter command.

## Authenticate into a destination vCenter using CA certificates

### Symptom

You are running `stembuild` from a location outside of your destination vCenter and `stembuild` is unable to authenticate.

### Explanation

You are running `stembuild` from a location with different vCenter permissions than your target VM.

### Solution

You must provide `stembuild` with the CA certificates needed to authenticate into your destination vCenter.

To stage CA certificates for `stembuild` to use to access a target VM in the destination vCenter:

1. Open your destination vCenter home page.
2. On the bottom right, click **Download trusted root CA certificates**.
3. Copy the downloaded CA certificates to a path accessible to `stembuild`.

To use the staged CA certificates with `stembuild`, include the optional `-vcenter-ca-certs` flag in your `stembuild` command as shown in the example `construct` and `package` command lines.

## Windows Diego Cells in isolation segments

You can run Windows Diego Cells in isolation segments, which are compartmentalized resource pools for Diego Cells.

Diego Cells in one isolation segment can share routing, computing, and logging resources with other Diego Cells in the same segment, and do not use resources from other isolation segments.

To run Windows Diego Cells in multiple isolation segments, you must create and install multiple VMware Tanzu Application Service for VMs [Windows] tiles and configure each to run in a different isolation segment.

To create multiple copies of the TAS for VMs [Windows] tile, see [Replicating a tile](#).

To associate a TAS for VMs [Windows] tile with an isolation segment, so that its Diego Cells run in that segment, see [Assigning a tile to an isolation segment](#).

## Prerequisites

To run a Windows Diego Cell in a particular isolation segment, the isolation segment must already exist in the Cloud Controller database (CCDB) before the Windows Diego Cell can be assigned to it.

To create an isolation segment in the CCDB, see [Creating an isolation segment](#) in *Managing isolation segments*.

## Replicating a tile

To make multiple copies of the TAS for VMs [Windows] tile that you can assign to different isolation segments, you must use the Replicator tool.

To use the Replicator tool:

1. Download the Replicator tool from the [VMware Tanzu Application Service for VMs \[Windows\]](#) page on Broadcom Support.
2. Go to the folder into which you downloaded the Replicator tool.
3. Replicate the tile by running:

```
replicator-windows -name "TITLE-NAME" -path PATH-TO-ORIGINAL -output PATH-TO-COP
Y
```

Where:

- **TITLE-NAME** is a unique name for the new TAS for VMs [Windows] tile. The name must be ten or fewer characters in length and contain only alphanumeric characters, dashes, underscores, and spaces.
- **PATH-TO-ORIGINAL** is the absolute path to the original `.pivotal` TAS for VMs [Windows] tile you downloaded from Broadcom Support.
- **PATH-TO-COPY** is the absolute path for the copy of the `.pivotal` TAS for VMs [Windows] tile that the Replicator tool produces.

For example:

```
C:\Users\admin\> replicator-windows -name "Shiny Tile" ^
-path c:\downloads\TileOriginal.pivotal ^
-output c:\temp\TileCopy.pivotal
```

4. Install and configure the Windows isolation segment, using the new `.pivotal` file and, follow the procedures in *Installing and configuring TAS for VMs [Windows]*, starting with **Import a Product** in [Install the tile](#).

## Assigning a tile to an isolation segment

To assign a TAS for VMs [Windows] tile to an isolation segment:

1. Click **App Containers**.
2. Under **Segment name**, enter a name that is unique across your TAS for VMs [Windows] deployment. This is the placement tag for your Diego Cells.
3. (Optional) To limit the number of log lines each app instance in your isolation segment can generate per second, select **Enable** under **App log rate limit (deprecated)** and enter an integer for **Maximum app log lines per second**. At minimum, VMware recommends using the default limit of `100`. This feature is deactivated by default.



This method of limiting log output from applications is deprecated. VMware recommends using the log rate limiting quota feature which provides more granular control over application log output.

4. Click **Save**.

## Windows authentication for .NET apps

Learn how to integrate your Windows Diego Cells with an existing Active Directory domain to enable support for apps using Windows Authentication. With Windows Authentication, you can access a Windows app on TAS for VMs [Windows] to transparently authenticate using your domain credentials.

## Security considerations

In some configurations, Windows Authentication sessions are cached by source IP and port. The Gorouter maintains [TCP connections](#) to application containers and reuses them for subsequent inbound HTTP requests. If you do not deactivate this behavior in applications using Windows Authentication, user authentication sessions might be shared among multiple users making HTTP requests to the Windows Authentication app. This is a serious security concern.

To deactivate this behavior in your applications:

- For [.NET Framework apps using the hwc\\_buildpack](#), the `authPersistSingleRequest` and `authPersistNonNTLM` IIS settings are set to `false` by default. Ensure that these settings are set to `false`, and that any Windows applications using Windows Authentication do not override these properties.
- For [.NET Core apps using the binary\\_buildpack](#), ensure that the `Microsoft.AspNetCore.Authentication.Negotiate.NegotiateOptions` for `PersistKerberosCredentials` and `PersistNtlmCredentials` settings are set to `false`.

If apps cannot be configured to deactivate this behavior, those apps must use TCP routing instead. The TCP router avoids this security concern because it does not maintain connections to application containers at all.

To activate TCP routing, see [Networking](#) for the TAS for VMs tile.

Apps using Windows Authentication can use the `--no-route` flag for the `cf push` command, or specify a `routes` section in the app manifest with only a TCP route. The `--no-route` flag no longer unbinds all existing routes associated with the app.

For more information, see the following:

- [.NET Core Negotiate Authentication documentation](#)
- [.NET Framework IIS Negotiate Authentication documentation](#)
- [.NET Core Windows Authentication documentation](#)

## Prerequisites

Before you configure the TAS for VMs [Windows] tile for Windows Authentication, you must meet the following requirements:

- Your Active Directory instance must be configured with a GMSA and a regular user that has been granted access to the GMSA credentials. See the [Microsoft documentation](#) for specifics.

- Your Windows Diego Cells must have the appropriate [firewall rules](#) to access the Active Directory instance.
- [Application Security Groups](#) must be configured to allow traffic from application containers to the Active Directory instance.
- If [TCP routing](#) is not enabled and configured, then applications must be told to not persist authentication sessions for NTLM + Kerberos.
- If using Gorouter for routing, ensure that the **Enable support for NTLM authentication in Gorouter** property is enabled in the Networking settings of the TAS for VMs tile. This allows the Gorouter to properly handle NTLM challenge-response style negotiation when apps are configured with multiple instances. If you use routed isolation segments in front of apps that use Windows Authentication, then you must configure this setting on the Isolation Segment tile, as well.



Support for Windows Authentication through the Gorouter was added in the following versions of TAS for VMs and IST:

- TAS for VMs v4.0.18 and IST v4.0.18
- TAS for VMs v5.0.8 and IST v5.0.8
- TAS for VMs v6.0.0 and IST v6.0.0



If your apps are not configured to deactivate persistent NTLM + Kerberos connections, then using Windows Authentication through the Gorouter might have undesirable security consequences. These apps must be accessible **only** through TCP routes.

- The **The Gorouter and apps use mutual TLS to verify each other's identity** setting described in [Advanced Features](#) must not be selected, as this deactivates TCP routing.
- Depending on your IaaS, you might need to configure BOSH DNS handlers so that your application containers can resolve domain resources through the Active Directory instance. See the [VMware Tanzu Operations Manager Documentation](#) for IaaS-specific instructions.
- Apps intending to use Windows Authentication must use the HWC buildpack.



Use an isolation segment for Windows Authentication, because all apps in the TAS for VMs [Windows] installation have access to GMSA credentials. To associate a TAS for VMs [Windows] tile with an isolation segment so that its Diego Cells run in that segment, see [Windows Diego Cells in isolation segments](#).

## Limitations

- Authenticating through the cf CLI with Windows Authentication is not supported.
- Every app in the TAS for VMs [Windows] installation has access to GMSA credentials. There is no way to configure it on an app-by-app basis.
- Windows Authentication delegation from app to service is not supported.

## Configuring the tile

Start the configuration by following the steps in the [Microsoft documentation](#) to create the appropriate values, then select **Windows Authentication** and use this procedure:

1. Under **Windows Authentication**, select **Configure**.
2. In the **For security reasons, apps using Windows Authentication must use TCP routing** text box, enter **X** to acknowledge this requirement. See [Security considerations](#) for the details.
3. In **Active Directory FQDN**, enter the domain of the Active Directory instance that application containers use for authentication.
4. In **Standard user name**, enter the name of the user account with access to the gMSA password. This is a user account.
5. In **Standard user password**, enter the password of the user account with access to the gMSA password. This is a user account.
6. In **Container credential spec**, enter a JSON string that describes the gMSA account and domain details. For more information about Windows Authentication, see [Microsoft documentation](#).
7. Click **Save**.
8. [Deploying the tile](#).

## Rotating the standard user

Follow the steps in the [Microsoft documentation](#), but do not create a new service account or security group.

1. Create a new user account.
2. Add the user to the security group that guards access to the GMSA service account.
3. Update the **Standard user name** and **Standard user password** text boxes with the new user information.
4. Click **Save**.
5. [Deploying the tile](#).

## Troubleshooting

For troubleshooting details, see [Troubleshooting Windows authentication](#).

## Upgrading TAS for VMs [Windows] and Windows stemcells

You can upgrade your VMware Tanzu Application Service for VMs [Windows] tile and update the Windows stemcell.

For information about migrating apps to TAS for VMs [Windows] from TAS for VMs [Windows] 2012 R2, see [Migrating apps to TAS for VMs \[Windows\]](#).



### Caution

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade TAS for VMs [Windows]. Failure to upgrade TAS for VMs first will result in TCP route outages on TAS for VMs [Windows]. For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

## Rotating credentials

The VMware Tanzu Application Service for VMs (TAS for VMs) tile handles all of the credentials for TAS for VMs [Windows].

To rotate your credentials in TAS for VMs [Windows], you must redeploy TAS for VMs and TAS for VMs [Windows]. To re-deploy TAS for VMs and TAS for VMs [Windows]:

1. Go to the VMware Tanzu Operations Manager Installation Dashboard.
2. Click **Review Pending Changes**.
3. Click the TAS for VMs and TAS for VMs [Windows] tiles and review the changes. For more information, see [Reviewing pending product changes](#).
4. Click **Apply Changes**.

## Upgrading TAS for VMs [Windows]

To upgrade TAS for VMs [Windows]:

1. Download the latest TAS for VMs [Windows] version from the [VMware Tanzu Application Service for VMs \[Windows\]](#) page on Broadcom Support.  
For more information about upgrading your Operations Manager products, see [Upgrading Operations Manager products](#) in *Upgrading TAS for VMs and Other Operations Manager products*.
2. If necessary, configure the product. For more information about configuring TAS for VMs [Windows], see [Installing and configuring TAS for VMs \[Windows\]](#).
3. Click **Review Pending Changes**.
4. Click the TAS for VMs [Windows] tile and review the changes. For more information, see [Reviewing pending product changes](#).
5. Click **Apply Changes**.

## Upgrading the Windows stemcell

To upgrade your Windows stemcell:

1. Retrieve the stemcell by following the steps for your IaaS (infrastructure as a service):
  - For vSphere, you must build your own stemcell. For more information, see the [BOSH documentation](#).
  - For AWS, GCP, and Azure, go to [Stemcells \(Windows\)](#) on Broadcom Support.
2. Go to [Stemcell Library](#).

3. Click **Import Stemcell** to import the stemcell file.
4. Activate the Tanzu Operations Manager product check box to stage your stemcell.
5. Click **Apply Stemcell to Products**.

For more information about Windows stemcells, see [Downloading or creating Windows stemcells](#).

## Migrating apps to TAS for VMs [Windows]

You can run apps on VMware Tanzu Application Service for VMs [Windows] 2012 R2 stemcells to run on TAS for VMs [Windows] stemcells, which run Windows Server 2019.



TAS for VMs [Windows] 2012 R2 has reached its end of availability (EoA) and is no longer available.

VMware recommends the blue-green deployment method for high availability.

For more information about blue-green deployments, see [Using blue-green deployment to reduce downtime and risk](#).

## Step 1: Installing and deploying the TAS for VMs [Windows] tile

To install and deploy the TAS for VMs [Windows] tile, follow steps 1 and 2 of [Installing and configuring TAS for VMs \[Windows\]](#).

## Step 2: Pushing an app to TAS for VMs [Windows] Diego Cells

To deploy a running app again with zero downtime using the blue-green method:

1. Log in to the Cloud Foundry Command Line Interface (cf CLI) by running:
- ```
cf login
```
2. Choose your org and space.
  3. Go to the location of your app.
  4. To find the name of the existing TAS for VMs [Windows] 2012 R2 app you are migrating to TAS for VMs [Windows] Diego, run:

```
cf apps
```

5. Create a name for the replacement TAS for VMs [Windows] app. VMware recommends you append `-green` to your existing app name, as shown here:

```
APP-NAME-green
```

Where `APP-NAME` is the name of the existing TAS for VMs [Windows] Diego 2012 R2 app.

- To push your app to a TAS for VMs [Windows] Diego Cell using your newly created name, run:

```
cf push APP-NAME-GREEN -s windows -b BUILDPACK -n HOSTNAME --no-start --no-route
```

Where:

- `APP-NAME-GREEN` is the newly created “green” name for your app.
- `BUILDPACK` is your custom buildpack. Specify the buildpack either by name or GitHub URL with an optional branch or tag.
- `HOSTNAME` is the name of your app’s subdomain. For example, if `example.com` is your domain and you want the URL to your app to be `http://my-app.example.com`, then specify `my-app` as the `HOSTNAME`.

For example:

```
C:\Users\admin\> cf push ExampleApp-green -s windows ^
-b https://github.com/cloudfoundry/binary-buildpack.git ^
-n my-app --no-start --no-route
```



The `--no-start` and `--no-route` parameters in this `cf push` command are required for this procedure. The `--no-start` parameter is used to create the instance VMs and not start the app, and the `--no-route` parameter prevents `cf push` from automatically mapping a route to the app, but no longer unbinds all existing routes associated with the app.

For more information about `cf push`, enter `cf help push`.

- To configure the router so all incoming requests go to both `APP-NAME` and `APP-NAME-green`, run:

```
cf map-route APP-NAME-green DOMAIN -n HOSTNAME
```

Where:

- `APP-NAME-green` is the name of the new “green” version of your app.
- `DOMAIN` is your domain name. For example, `example.com`.
- `HOSTNAME` is the name of your app’s subdomain. For example, if `example.com` is your domain and you want the URL to your app to be `http://my-app.example.com`, then specify `my-app` as the `HOSTNAME`.

When you use the `cf map-route` command, you must specify domain name after you specify the app name. For additional information, enter `cf help map-route`.

- To start the green app, run:

```
cf start APP-NAME-green
```

Where `APP-NAME-green` is the name of the new “green” version of your app.

- To confirm that both your `APP-NAME` and `APP-NAME-green` apps are running, run:

```
cf apps
```

If you experience a problem, see [Troubleshooting app deployment and health](#).

- To unmap the original app's route, run:

```
cf unmap-route APP-NAME DOMAIN -n HOSTNAME
```

Where:

- APP-NAME** is the name of the existing version of your app you want to replace with **APP-NAME-green**.
- DOMAIN** is your domain name, for example, `example.com`.
- HOSTNAME** is the name of your app's subdomain. For example, if `example.com` is your domain and the existing app is accessed using the URL `http://my-app.example.com`, then specify `my-app` as the **HOSTNAME**.

For additional information about `cf-unmap-route`, enter `cf help unmap-route`.

## Step 3: Deleting an app from TAS for VMs [Windows] 2012 R2 Server Diego Cells

To delete the original app:

- Run:

```
cf delete APP-NAME
```

Where **APP-NAME** is the name of the app that you replaced with **APP-NAME-green**.



Running the command with the `-r` flag no longer deletes routes when the route is mapped to more than one app.

For additional information about `cf delete` command, enter `cf help delete`.

## Step 4: Uninstalling the old tile (optional)

After you migrate all your apps and you are no longer using the TAS for VMs [Windows] 2012 R2 tile, a Operations Manager uninstalls the tile.

To uninstall the tile:

- From the Installation Dashboard, click the Trash icon on the tile to remove that product. In the **Delete Product** pane, click **Confirm**.
- Click **Review Pending Changes**.
- Click the TAS for VMs [Windows] tile and review the changes. For more information, see [Reviewing pending product changes](#).
- Click **Apply Changes**.

After you delete a product, the product tile is removed from the installation and the Installation Dashboard. However, the product appears in the **Available Products** view.

## Troubleshooting Windows Diego Cells

Learn how to troubleshoot your VMware Tanzu Application Service for VMs [Windows] (TAS for VMs [Windows]) issues.

### Installation issues

This section describes the issues that might occur during installation.

#### Missing local certificates for Windows FS Injector

##### Symptom

You run the `winfs-injector` and see this certificate error:

```
Get https://auth.docker.io/token?service=registry.docker.io&
scope=repository:cloudfoundry/windows2016fs:pull: x509:
failed to load system roots and no roots provided
```

##### Explanation

Local certificates are needed to communicate with Docker Hub.

##### Solution

Complete the installation of the necessary certificates on your local machine. On Ubuntu, you can install certificates with the `ca-certificates` package.

#### Outdated version for Windows FS Injector

##### Symptom

You run the `winfs-injector` and see this missing file or directory error:

```
open ...windows2016fs-release/VERSION: no such file or directory
```

##### Explanation

You are using an outdated version of the `winfs-injector`.

##### Solution

From the [VMware Tanzu Application Service for VMs \[Windows\]](#) page on Broadcom Support, download the recommended version of **Windows FS Injector** for the tile.

#### Missing container image

##### Symptom

You clicked the + icon in Operations Manager to add the TAS for VMs [Windows] tile to the Installation Dashboard and see this error:

**A** is invalid: has an invalid release 'windows2016fs' specified for job type 'Windows Diego Cell'

## Explanation

The product file that you are trying to upload does not contain the Windows Server container base image.

## Solution

1. Delete the product file listing from Operations Manager by clicking the Trash can icon under **Import a Product**.
2. Follow the TAS for VMs [Windows] installation instructions to run the `winfs-injector` tool locally on the product file. This step adds the Windows Server container base image to the product file, requires Internet access, and can take up to 20 minutes. For more information, see [Installing and configuring TAS for VMs](#).
3. Click **Import a Product** to upload the injected product file.
4. Click the + icon next to the product listing to add the TAS for VMs [Windows] tile to the Installation Dashboard.

## Upgrade issues

This section describes issues that might occur during upgrade.

### Failure to create Containers when upgrading with Shared Microsoft Base image

#### Symptom

The prestart script for the `windowsfs` job fails, and the upgrade fails:

```
Task 308031 | 13:47:04 | Preparing deployment: Preparing deployment (00:00:03)

Task 308031 | 13:47:11 | Preparing package compilation: Finding packages to compile (0
0:00:00)

Task 308031 | 13:47:21 | Updating instance windows_diego_cell: windows_diego_cell/44c5
841f-7580-4e9c-9856-89fcbe08ab0d (2) (canary) (00:00:35)

L Error: Action Failed get_task: Task 59ba76d1-14c5-4d7b-681c-08b9ec4bd64d result: 1 o
f 10 pre-start scripts failed. Failed Jobs: windows1803fs. Successful Jobs: set_kms_ho
st, groot, loggregator_agent_windows, bosh-dns-windows, rep_windows, winc-network-180
3, set_password, enable_ssh, enable_rdp.

Task 308031 | 13:47:56 | Error: Action Failed get_task: Task 59ba76d1-14c5-4d7b-681c-0
8b9ec4bd64d result: 1 of 10 pre-start scripts failed. Failed Jobs: windows1803fs. Succ
essful Jobs: set_kms_host, groot, loggregator_agent_windows, bosh-dns-windows, rep_win
dows, winc-network-1803, set_password, enable_ssh, enable_rdp.
```

Otherwise, the post-start script for the `rep_windows` job fails, and the upgrade fails:

```
Task 8192 | 21:12:30 | Updating instance windows2019-cell: windows2019-cell/bd6d70b9-e
d1f-412f-9d49-8045627f4ab3 (0) (canary) (00:17:24)
```

```

L Error: Action Failed get_task: Task a9555020-1a3b-40c7-677c-d6f
c392ce135 result: 1 of 3 post-start scripts failed. Failed Jobs: rep_windows. Successf
ul Jobs: route_emitter_windows, bosh-dns-windows.
Task 8192 | 21:29:55 | Error: Action Failed get_task: Task a9555020-1a3b-40c7-677c-d6f
c392ce135 result: 1 of 3 post-start scripts failed. Failed Jobs: rep_windows. Successf
ul Jobs: route_emitter_windows, bosh-dns-windows.

```

## Explanation

When you upgrade between versions of Windows rootfs that have a shared Microsoft base layer, TAS for VMs [Windows] might fail to create containers.

## Solution

For available workarounds, see [Failure to create containers when upgrading with shared Microsoft base image](#).

## Forwarding logs to a syslog server

You can use Windows Diego Cell logs to troubleshoot Windows Diego Cells. Windows Diego Cells generate several types of logs:

- **BOSH job logs**, such as `rep_windows` and `consul_agent_windows`. These logs stream to the syslog server configured in the **System Logging** pane of the TAS for VMs [Windows] tile. The names of these BOSH job logs correspond to the names of the logs emitted by Linux Diego Cells.
- **Windows event logs**. These logs stream to the syslog server configured in the **System Logging** pane of the TAS for VMs [Windows] tile.

To forward Windows logs to an external syslog server:

1. Go to the Operations Manager Installation Dashboard.
2. Click the TAS for VMs [Windows] tile.
3. Click **System Logging**.
4. For **VM log forwarding**, select **Configure**.
5. In **Syslog server address**, enter the host name or IP address of your syslog server.
6. Under **Syslog server port**, enter the port of your syslog server. The default port is `514`. The host must be reachable from the TAS for VMs network. Ensure that your syslog server listens on external interfaces.
7. Under **Transport protocol**, select the transport protocol for forwarding logs.
8. If you are using a TCP protocol and want to allow TLS communication:
  1. Activate the **Send logs over TLS** check box.
  2. For **CA certificate**, provide the CA certificate that validates connections to an external server. The certificate used to send logs to your syslog server over TLS.
9. Under **ca\_cert**, add the certificate to validate connections to external server if using tls.
10. Select the **Enable system metrics** check box. For a list of the VM metrics that the System Metric Agent emits, see [System Metrics Agent](#) in the System Metrics repository on GitHub.
11. Click **Save**.

## Downloading Windows Diego Cell logs

To download Windows Diego Cell logs:

1. Go to the Operations Manager Installation Dashboard.
2. Click the TAS for VMs [Windows] tile.
3. Click the **Status** tab.
4. In the **Logs** column, click the Download icon for the Windows Diego Cell for which you want to retrieve logs.
5. Click the **Logs** tab.
6. When the logs are ready, click the filename to download them.
7. Unzip the file and examine the contents. Each component on the Diego Cell has its own log folder:
  - `/consul_agent_windows/`
  - `/garden-windows/`
  - `/metron_agent_windows/`
  - `/rep_windows/`

## Troubleshooting Windows compilation VMs

BOSH deletes a compilation VM after the compilation VM fails. In a vSphere environment, use one of these procedures to troubleshoot your Windows stemcell v2019.7 and any compilation VM issues that follow:

- [Troubleshoot a slowly-deleted Windows compilation VM](#)
- [Troubleshoot a quickly-deleted Windows compilation VM](#)

### Troubleshooting a slowly deleted Windows compilation VM

The easiest method to troubleshoot a Windows compilation VM is to use SSH into the VM before BOSH deletes it.

To troubleshoot a compilation VM from an `ssh` session:

1. Open the vSphere UI.
2. Open two different BOSH CLI terminal sessions.
3. Open Tanzu Operations Manager.
4. For these settings in Tanzu Operations Manager:
  - Select **Keep Unreachable Director VMs** from the **BOSH Director** tile, then click **Director config**.
  - Select **Access VMs with BOSH SSH** on the TAS for VMs [Windows] tile, then click **VM options**.
5. Click **Apply Changes** against the TAS for VMs [Windows] tile.
6. From the first BOSH CLI terminal, monitor the BOSH task:

```
watch -n 5 "bosh -d TAS-WINDOWS-DEPLOYMENT is --details | grep compilation"
```

Where `TAS-WINDOWS-DEPLOYMENT` is the name of your TAS for VMs [Windows] deployment.

7. Wait until the compilation VM CID is up.
8. From the second BOSH CLI terminal window, SSH to the Windows compilation VM:

```
bosh -d TAS-WINDOWS-DEPLOYMENT ssh COMPILATION-NAME
```

Where:

- `TAS-WINDOWS-DEPLOYMENT` is the name of your TAS for VMs [Windows] deployment.
  - `COMPILATION-NAME` is the name of your Windows compilation VM.
9. To prevent BOSH from deleting the compilation VM after the compilation VM fails, search for the compilation VM CID in the vSphere UI and rename it. You are now able to troubleshoot within this session.
  10. After troubleshooting, delete the VM manually.

## Troubleshooting a quickly deleted Windows compilation VM

In some situations, the Windows compilation VM might be deleted, making it impossible to SSH into the VM before BOSH deletes it.

To troubleshoot a deleted compilation VM:

1. Download an Ubuntu desktop image from [Ubuntu Releases Xenial](#).
2. Upload the Ubuntu desktop image into your vSphere datastore.
3. Open the vSphere UI.
4. Open a BOSH CLI terminal session.
5. Open Tanzu Operations Manager.
6. For these settings in Tanzu Operations Manager:
  - Select **Keep Unreachable Director VMs** from **BOSH Director** tile, then click **Director config**.
  - Select **Access VMs with BOSH SSH** from TAS for VMs [Windows] tile, then click **VM options**.
7. Click **Apply Changes** in Tanzu Operations Manager.
8. From the BOSH CLI terminal window, monitor the BOSH task:

```
watch -n 5 "bosh -d TAS-WINDOWS-DEPLOYMENT is --details | grep compilation"
```

Where `TAS-WINDOWS-DEPLOYMENT` is the name of your TAS for VMs [Windows] deployment.

9. Wait until the compilation VM CID is done.
10. From the vSphere UI:
  1. Locate the compilation VM CID in the vSphere UI.

2. To prevent BOSH from deleting the compilation VM after the compilation VM fails, rename the compilation VM.
  3. On the Windows compilation VM, go to **Edit settings**, then click **add a device CD/DVD drive**. Click **browse Datastore ISO file**, select the Ubuntu desktop iso, then click **Connect at Power ON**.
  4. Go to **Edit settings -> VM options tab -> Boot Options**.
  5. Increase the **Boot Delay** to `10000 milliseconds`.
  6. Click **Force BIOS Setup**.
  7. Click **Start/Rotate** to start the VM again.
  11. On the BIOS setup screen, boot with the CD-ROM Drive.
  12. After Ubuntu desktop starts, click **try Ubuntu** and launch a terminal window.
  13. In the terminal window, run:
- ```

sudo fdisk -l
sudo mkdir /mnt/windows
sudo mount /dev/sda1 /mnt/windows

```
14. You can now troubleshoot within this session by exploring the contents of the windows VM's file system within `/mnt/windows`.
  15. After troubleshooting, delete the VM manually.

## Windows authentication

For the basics, start with the [Microsoft documentation](#).

The Windows Authentication feature uses the Windows event log system. To access a log from the Windows Diego Cell, `ssh` onto the cell, then enter `powershell`. To get the events in an event log, use the command `Get-WinEvent`:

```

> bosh ssh -d TAS-WINDOWS-DEPLOYMENT windows_diego_cell/INDEX
> powershell
PS> Get-WinEvent -LogName LOG-NAME

```

Where `TAS-WINDOWS-DEPLOYMENT` is the name of your TAS for VMs [Windows] deployment, `INDEX` is the VM you want to access, and `LOG-NAME` is the name of the log for which you want to view events.

## TAS for VMs gMSA plug-in logs

TAS for VMs [gMSA plugin](#) logs are in the event log `Cloudfoundry-CCG-Plugin`. They tell you if the plug-in has run successfully, and if the input to the plug-in is correct. Success logs look like this:

```

PS> Get-WinEvent -LogName Cloudfoundry-CCG-Plugin
ProviderName: CfCcgPlugin

TimeCreated                Id LevelDisplayName Message
-----                    -- -----
10/28/2022 6:06:58 PM      0 Information      Successfully got password credenti

```

```

als
10/28/2022 6:06:58 PM      0 Information      Plugin invoked
10/28/2022 6:06:58 PM      0 Information      Plugin instantiated

```

## Windows compute service logs

If Windows containers do not start, you can check the logs for the Host Compute Service, which is the Windows component that administers Windows containers.

Success logs look like this:

```

PS> Get-WinEvent -LogName Microsoft-Windows-Hyper-V-Compute-Admin

ProviderName: Microsoft-Windows-Hyper-V-Compute

TimeCreated          Id LevelDisplayName Message
-----          -- -----
10/28/2022 5:57:30 PM    1001 Information   The Host Compute Service started successfully.

```

## Windows container credential guard logs

In the event that Windows containers do not start, or Windows Authentication does not work through an app, you can check the logs for the [CCG.exe](#) process. This runs the TAS for VMs plug-in and establishes connectivity to the Active Directory. Successful logs look like this example:

```

PS> Get-WinEvent -LogName Microsoft-Windows-Containers-CCG/Admin

ProviderName: Microsoft-Windows-Containers-CCG

TimeCreated          Id LevelDisplayName Message
-----          -- -----
10/28/2022 6:35:34 AM    2 Information   Container Credential Guard fetched gmsa credentials for GMSA$ using plugin: {8019A64C-3F4E-4DE3-AD2B-9A544290E2C3}.

```

Where `GMSA$` is the name of your GMSA service account.

For a list of possible `Microsoft-Windows-Containers-CCG` events, see the [Microsoft Troubleshooting documentation](#).



You might need to follow [additional steps](#) to have events show up in the `Microsoft-Windows-Containers-CCG` log. If you have additional questions, you can contact Support.

## Testing connectivity to Active Directory

Both the Windows Diego Cell and the application container must have network connectivity to the Active Directory instance. The [Firewall rules](#) must be set up correctly. If you have connectivity from the Windows Diego Cell but not from the application container, verify that there are no [App Security Groups](#) preventing access from application containers.

From inside an application container, if the network connectivity is set up correctly, these commands must be successful:

```

nslookup AD.DOMAIN          # Make sure DNS is properly set
ping AD.DOMAIN              # Make sure basic connectivity to the Domain Controllers i
s working
nltest /sc_query:AD.DOMAIN  # Make sure the secure channel to the Domain Controllers i
s working

```

Where `AD.DOMAIN` is the fully-qualified domain name of the Active Directory instance.

If the environment variable `COMPUTERNAME` is not set to `GMSA$` and the `USERDNSDOMAIN` variable is not set to `AD.DOMAIN`, verify your tile setup.

## Isolation Segment

In this section:

- [Installing Isolation Segment](#)
- [Managing isolation segments](#)
- [Routing for isolation segments](#)

## Installing Isolation Segment

Use these instructions to install the Isolation Segment tile, which allows you to isolate deployment workloads into dedicated resource pools called *isolation segments*.

Installing the tile installs a single isolation segment. However, you can install multiple isolation segments using the Replicator tool shown in [Step 4](#).

After you install the tile, you must follow the procedure in [Register an isolation segment](#) in *Managing isolation segments* to create the isolation segment in the Cloud Controller database (CCDB). The topic also includes information about managing an isolation segment.

For more information about how isolation segments work, see [Isolation segments in TAS for VMs Security](#).

## Step 1: Configure routing (Optional)

By default, the VMware Tanzu Application Service for VMs (TAS for VMs) Gorouter handles traffic for your isolation segment. However, you can deploy a dedicated Gorouter for your isolation segment instead. For information about configuring and managing routing for isolation segments, see [Routing for isolation segments](#).

To deploy a dedicated Gorouter:

1. Add a load balancer in front of the TAS for VMs Gorouter. The steps to do this depend on your IaaS, but the setup of the load balancer must mirror the setup of the load balancer for the TAS for VMs Gorouter that you configured in the TAS for VMs tile.
2. Create a wildcard DNS entry for traffic routed to any app in the isolation segment. For example, `*.iso.example.com`.
3. Attach the wildcard DNS entry to the load balancer you created.

## Step 2: Install the tile

To install the Isolation Segment tile:

1. Download the product file from the [Isolation Segment](#) page of Broadcom Support.
2. Go to your Tanzu Operations Manager URL in a browser to log in to the Tanzu Operations Manager Installation Dashboard.
3. Click **Import a Product** and select the downloaded product file.
4. Under **Isolation Segment** in the left column, click the + icon.

## Step 3: Configure the tile

Click the orange **Isolation Segment** tile to start the configuration process.

### Assign AZs and networks

In the **Assign AZ and Networks** pane, you assign jobs to your Availability Zones (AZs) and networks.

To configure the **Assign AZ and Networks** pane:

1. Select **Assign AZs and Networks**.
2. Select an AZ for your singleton jobs, and one or more AZs to balance other jobs in.
3. Select a network. This network does not need to be the same network where you deployed TAS for VMs. For most deployments, operators can create unique networks in which to deploy the Isolation Segment tile. These networks can maintain network reach with the Diego components because the Diego Cells can reach the Diego Brain and Diego Database VMs.
4. Click **Save**.

### Configure networking

In the **Networking** pane, you configure security and routing services for your IaaS.

To configure the **Networking** pane:

1. Select **Networking**.
2. (Optional) Under **Gorouter IPs**, enter one or more static IP addresses for the Gorouters that handle this isolation segment. These IP addresses must be within the subnet CIDR block that you defined in the Tanzu Operations Manager network configuration for your isolation segment. If you have a load balancer, configure it to point to these IP addresses.



Entering the static IP addresses is not necessary for deployments running on a public IaaS such as AWS, GCP, or Azure because users specify the IaaS load balancer in the **Resource Config** pane of the Isolation Segment tile.

3. Under **Certificates and private keys for the Gorouter**, you must provide at least one certificate and private key pair for the Gorouter. The Gorouter is configured to receive TLS communication by default. You can configure multiple certificates for the Gorouter.



When providing custom certificates, enter them in this order: `wildcard`,

 [Intermediate](#), [CA](#). For more information, see the [DigiCert documentation](#).

1. To configure a certificate and private key for the Gorouter:
  1. Click **Add**. The Gorouter uses the certificate you configure as the default certificate.
  2. For **Name**, enter a human-readable name that describes the use of this certificate.
  3. For **Certificate and private key**, choose one of the following options:
    - Enter a certificate signed by a Certificate Authority (CA).
    - Click **Generate RSA Certificate**. Clicking this link causes the Tanzu Operations Manager CA to automatically generate a certificate.

For the values to use, see [Providing a Certificate for your TLS termination point](#).



If you configured your Tanzu Operations Manager front end without a certificate, you can use this new certificate to finish configuring Tanzu Operations Manager. To configure your Tanzu Operations Manager front end certificate, see the [Tanzu Operations Manager documentation](#).

2. (Optional) To configure multiple certificates for the Gorouter:
  1. For each additional certificate and key pair, click **Add**.
  2. Configure the fields you configured for the first certificate and key pair in the previous step. For more information about generating certificates in Tanzu Operations Manager for your wildcard system domains, see [Providing a Certificate for Your TLS Termination Point](#).



Ensure that you add any certificates that you generate in this pane to your infrastructure load balancer.

4. (Optional) When validating requests using mutual TLS to back ends and route services, the Gorouter trusts multiple CAs by default. To configure which CA certificates Gorouter trusts, choose one of the following options:
  - For backwards compatibility with older versions of Isolation Segment:
    1. Under **Trusted CAs for client requests**, select **Trust the same CAs used for back ends and route services**.
  - If you want the Gorouter to trust a particular set of CAs only:
    1. Under **Trusted CAs for client requests**, select **Only trust the following CAs**.
    2. For **Trusted client CAs**, enter the CAs you want the Gorouter to trust. The CAs you provide in this field are the only CAs that the Gorouter trusts for client requests. The Gorouter does not trust any well-known CAs that are provided with the stemcell.
5. Under **TLS versions**, select the range of TLS versions to use in Gorouter communications. The Gorouter supports TLS v1.2 to TLS v1.3 by default. If you need to accommodate clients that use

an older version of TLS, select a lower minimum version. For a list of TLS ciphers supported by the Gorouter, see [TLS cipher suite support](#) in *Securing traffic into TAS for VMs*.

6. (Optional) Under **Load balancing algorithm**, select either **Round-robin** or **Least-connection** as your load balancing algorithm for the Gorouter. **Round-robin** is selected by default, and VMware recommends this option for most use cases. Some use cases, such as those where apps have long-lived connections, might benefit from the least-connection algorithm. For more information, see [Router balancing algorithm](#) in *HTTP Routing*.

(Optional) Under **Load balancing algorithm availability zone preference**, select either **None** or **Locally-optimistic** as the availability zone preference for the Gorouter's load balancing algorithm. **None** is selected by default, and VMware does not recommend changing it. For more information, see [Load balancing availability zone preference](#) in *HTTP Routing*.

7. Under **Client IP logging**, **Log client IPs** is selected by default. To comply with the General Data Protection Regulation (GDPR), select one of the following options:
  - If your load balancer exposes its own source IP address, select **Do not log X-Forwarded-For header**.
  - If your load balancer exposes the source IP address of the originating client, select **Do not log source IP or X-Forwarded-For header**.
8. Under **TLS termination point**, configure how TAS for VMs handles `x-forwarded-client-cert` (XFCC) HTTP headers based on where TLS is terminated for the first time in your deployment. The table below indicates which option to choose based on your deployment configuration:

Deployment configuration	TLS option	Additional notes
<ul style="list-style-type: none"> <li>◦ The load balancer is terminating TLS, and</li> <li>◦ The load balancer is configured to put the client certificate from a mutual authentication TLS handshake into the X-Forwarded-Client-Cert HTTP header.</li> </ul>	Infrastructure load balancer	The Gorouter forwards the XFCC header when included in the request.
<ul style="list-style-type: none"> <li>◦ The load balancer is configured to pass through the TLS handshake through TCP to instances of the Gorouter</li> </ul>	Gorouter	The Gorouter strips the XFCC header if it is included in the request and forwards the client certificate received in the TLS handshake in a new XFCC header.

 If you select the **The Gorouter does not request client certificates** option in the **Gorouter behavior for client certificate validation** field, the XFCC header cannot be delivered to apps.

For a description of the behavior of each configuration option, see [Forward Client Certificate to Apps](#) in *HTTP Routing*.

9. To configure Gorouter behavior for handling client certificates, select one of the following options under **Gorouter behavior for client certificate validation**:
  - **The Gorouter does not request client certificates:** The Gorouter does not request client certificates, so the client does not provide them, and the Gorouter does not validate them.
  - **The Gorouter requests but does not require client certificates:** The Gorouter requests client certificates in TLS handshakes and validates them when they are presented, but does not require them. This option is configured by default.
  - **The Gorouter requires client certificates:** The Gorouter validates that the client certificate is signed by a Certificate Authority (CA) that the Gorouter trusts. If the Gorouter cannot validate the client certificate, the TLS handshake fails.

Requests to the platform fail upon upgrade if your load balancer is configured with client certificates and the Gorouter is not configured with the appropriate CA. To mitigate this issue, select **The Gorouter does not request client certificates**.

10. In the **TLS cipher suites for the Gorouter** field, review the TLS cipher suites for TLS handshakes between the Gorouter and front end clients such as load balancers. The default value for this field is `ECDHE-RSA-AES128-GCM-SHA256:TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384`.

To modify the default configuration, use an ordered, colon-separated list of Golang-supported TLS cipher suites in the OpenSSL format. This field does not apply to TLS v1.3. For TLS v1.3, the Gorouter only uses a set of default ciphers, and this is not configurable.

Verify that the ciphers are supported by any clients or front end components that initiate TLS handshakes with the Gorouter. For a list of TLS ciphers supported by the Gorouter, see [TLS Cipher Suite Support in Securing Traffic into TAS for VMs](#).

Verify that every client participating in TLS handshakes with the Gorouter has at least one cipher suite in common with the Gorouter.



Specify cipher suites that are supported by the versions configured under **Select the range of TLS versions supported by the Gorouter**. For example, TLS v1.3 does not support configuring cipher suites. If you select **TLSv1.3 only**, you cannot configure cipher suites for the Gorouter.

AWS Classic Load Balancers do not support the TAS for VMs default cipher suites. For more information about configuring your AWS load balancers and Gorouter, see [TLS Cipher suite support by AWS load balancers in Securing traffic into TAS for VMs](#).

11. (Optional) If you want the Gorouter to reject any unencrypted traffic, select the **Reject HTTP requests** check box. When this check box is selected, the Gorouter does not listen on port `80`.
12. (Optional) To configure the Gorouter to only generate secure cookies, select the **Do not use insecure cookies** check box.
13. (Optional) To deactivate the addition of Zipkin tracing headers on the Gorouter, deselect the **Enable Zipkin tracing headers on the Gorouter** check box. Zipkin tracing headers are enabled by default. For more information about using Zipkin trace logging headers, see [HTTP headers for zipkin tracing in HTTP routing](#).

14. (Optional) To activate the addition of W3C tracing headers on the Gorouter, select the **Add W3C tracing headers** check box. W3C tracing headers are disabled by default. Specify W3C tracing tenant ID name in **W3C tenant ID** field. If specified, the tracestate identifier will be "tenant-id@gorouter" where "tenant-id" is the value specified. If not specified, the tracestate identifier will be `gorouter`. For more information about using W3C trace logging headers, see [HTTP headers for W3C tracing](#) in [HTTP routing](#).
15. (Optional) The **Allow the Gorouter to write access logs locally** check box is selected by default. VMware recommends deselecting this check box for high-traffic deployments, since logs might not be rotated fast enough and can fill up the disk.
16. (Optional) By default, the Gorouter does not accept PROXY requests. To configure the Gorouter to accept PROXY requests, select the **Accept PROXY requests** check box. When you select this check box, client-side load balancers that stop TLS but do not support HTTP can pass along information from the originating client using the PROXY protocol. Configuring this option might impact Gorouter performance. For more information about configuring the Gorouter to accept PROXY requests, see the *About HTTP header forwarding* sections in [Securing Traffic into TAS for VMs](#).
17. Selecting the **Bypass security checks for route service lookup** check box might create security concerns. However, you might need to select this check box for backwards compatibility. For more information, see [Route Services](#).
18. (Optional) To limit the number of app connections to the back end, enter a value in **Maximum connections per back end**. Configuring this field allows you to prevent a poorly-behaving app from impacting other apps. To allow an unlimited number of app connections to the back end, enter either `0` or no value. The default value is `500`.

To determine a value to configure in this field, review the highest number of concurrent connections that instances of the most popular apps in your deployment have received. You can determine the number of concurrent connections for an app by reviewing the `httpStartStop` event metrics emitted for each app request. If your deployment uses App Metrics, you can also find this information in your App Metrics deployment. For more information, see the [App Metrics documentation](#).

19. Under **Keep-alive connections**, select one of the following options:
  - **Allow:** The Gorouter maintains TCP connections after receiving an HTTP response. This option is selected by default.
  - **Do not allow:** The Gorouter closes TCP connections after receiving an HTTP response.
 For more information, see [Keep-alive connections](#) in [HTTP Routing](#).
20. (Optional) For **Back end request timeout and idle timeout**, enter in seconds the amount of time that requests between the Gorouter and apps are allowed to remain idle before being closed. The default value is `900`. To accommodate larger uploads over connections with high latency, increase the value.
21. (Optional) To configure whether the Gorouter shows or hides GET request query parameters in access logs, select one of the following options under **Query parameter logging in Gorouter access logs**:
  - **Log query parameters:** The Gorouter logs all query parameters without altering them.



If you select this option, GET request query parameters in Gorouter access logs might contain sensitive information.

- **Log a hash of query parameters:** The Gorouter hashes all query parameters.
  - **Do not log query parameters:** The Gorouter hides all query parameters.
22. (Optional) Increase the value of **Load balancer unhealthy threshold** to specify the amount of time, in seconds, that the Gorouter continues to accept connections before shutting down. During this period, health checks might report the Gorouter as unhealthy, which causes load balancers to failover to other Gorouters. Configure a value that is greater than or equal to the maximum time it takes your load balancer to consider a Gorouter instance unhealthy, given repeated failed health checks.
23. (Optional) Modify the value of **Load balancer healthy threshold**. This field specifies the amount of time, in seconds, to wait until declaring the Gorouter instance started. This allows an external load balancer enough time to register the Gorouter instance as healthy.
24. (Optional) If app developers in your organization want certain HTTP request headers to appear in their app logs with information from the Gorouter, enter them as a comma-separated list under **HTTP headers to log**. For example, to support app developers that deploy Spring apps to TAS for VMs, you can enter Spring-specific HTTP request headers.

The Gorouter always logs the following HTTP request headers:

- `Referer`
  - `User-Agent`
  - `X-Forwarded-For`
  - `X-Forwarded-Proto`
  - `X-Vcap-Request-ID`
25. For \*\*Maximum request header size\*\*, enter the maximum total size (in KB) that all headers in a request to the Gorouter might have combined, including header keys, header values, and all values in the request line. Configuring this field allows TAS for VMs to prevent denial-of-service attacks from requests with large headers. Requests with headers that exceed this limit cause a `431` status code. Enter a value between `1` and `1024`. VMware recommends configuring a limit of `48`. To account for backwards compatibility, you can configure a higher limit, if required. Configuring this field does not limit the size of the request body.
26. For **DNS search domains**, enter the domains for your app containers to use as DNS search domains as a comma-separated list. Your containers append these search domains to host names to resolve them into full domain names.
27. The **Enforce Silk network policy** check box is selected by default. To deactivate Silk network policy enforcement between apps, deselect this check box. Deactivating network policy enforcement allows all apps to send network traffic to all other apps in the foundation, despite no policy specifically allowing it.
28. (Optional) For additional security, under **HTTP response headers to remove**, enter headers that you want the Gorouter to remove from app responses in the **Header name** field.

29. (Optional) Under **Sticky session cookies**, enter one or more sticky session cookie names in the **Cookie name** field. The default cookie name is `JSESSIONID`. Some apps require a different cookie name. For example, Spring WebFlux requires `SESSION` for the cookie name. Gorouter uses these cookies to support session affinity, or *sticky sessions*. For more information, see [Session Affinity in HTTP Routing](#).
30. Click **Save**.

## Configure app containers

In the **App Containers** pane, you enable microservice frameworks, private Docker registries, and other services that support your apps at the container level.

To configure the **App Containers** pane:

1. Select **App Containers**.
2. (Optional) To give apps that generally stay within their CPU entitlements priority access to extra CPU during CPU bursts, activate the **Allow CPU burst optimization** check box. This check box is activated by default. When this check box is activated, apps that generally stay within their CPU entitlements have higher-priority access to extra CPU than apps that generally exceed their CPU entitlements. When this check box is deactivated, all apps have equal access to extra CPU during CPU bursts. Whether you activate or deactivate this check box, all apps are always guaranteed the amount of CPU that is within their CPU entitlements.
3. Choose how the Gorouter verifies app identity to activate encryption and prevent misrouting under **Gorouter app identity verification**:
  - **The Gorouter uses TLS to verify app identity:** Activates the Gorouter to verify app identity using TLS. This is the default option.
  - **The Gorouter and apps use mutual TLS to verify each other's identity:** Activates your apps and the Gorouter to verify each other's identity using mutual TLS (mTLS). This option deactivates TCP routing because app containers accept incoming communication only from the Gorouter.

For more information, see [Preventing Misrouting in HTTP Routing](#).

4. (Optional) You can configure TAS for VMs to run app instances in Docker containers by provided a comma-separated list of their IP address ranges in the **Docker registry allow list** text box. For more information, see [Using Docker Registries](#).
5. Select your preference for disk cleanup scheduling. If you choose **Clean up disk space once usage fills disk**, enter a value in MB for **Reserved disk space for other jobs**. This is the amount of space that the garbage collection algorithm must keep free for other jobs. For more information about the configuration options and how to configure a reserved amount, see [Configuring Diego Cell Disk Cleanup Scheduling](#).
6. The **Allow containerd delegation** check box governs whether Garden delegates container create and destroy operations to the containerd tool. By default, this option is activated and Garden uses containerd. To deactivate this option, deselect the check box. For more information about the containerd tool, see [containerd](#).
7. Under **NFSv3 volume services**, click **Allow** or **Do not allow**. NFS volume services allow app developers to bind existing NFS volumes to their apps for shared file access. For more information,

see [Enabling Volume Services](#).



### Important

In a fresh installation, NFSv3 volume services are activated by default. In an upgrade, NFSv3 volume services is set to the same setting as it was in the previous deployment.

8. (Optional) To configure LDAP for NFSv3 volume services:

- For **LDAP service account user**, enter the user name of the service account in LDAP that manages volume services.
- For **LDAP service account password**, enter the password for the service account.
- For **LDAP server host**, enter the hostname or IP address of the LDAP server.
- For **LDAP server port**, enter the LDAP server port number. The default port is 389.
- For **LDAP user search base**, enter the location in the LDAP directory tree from which any LDAP user search begins. The typical LDAP search base matches your domain name. For example, a domain named `cloud.example.com` typically uses the following LDAP user search base: `ou=Users,dc=example,dc=com`.
- (Optional) For **LDAP server CA certificate**, you can enter a certificate if your LDAP server supports TLS and you want to enable TLS connections from the NFS driver to your LDAP server. This is the CA certificate that your LDAP server uses to verify the TLS certificates for NFS. Paste in the root certificate from your CA certificate or your self-signed certificate.



### Important

UAA can only parse one certificate entered into this field. If you enter multiple certificates, UAA only uses the first one you entered and ignores the rest. You only need to include one root certificate or self-signed certificate.

9. (Optional) To limit the number of log entries each app instance in your isolation segment can generate per second, click **Enable** under **App log rate limit (deprecated)** and enter an integer for **Maximum app log lines per second**. At minimum, VMware recommends using the default limit of `100`. This feature is deactivated by default.



### Note

This method of limiting log output from applications is deprecated. VMware recommends using the log rate limiting quota feature, which provides more granular control over application log output.

10. Click **Save**.

## Configure system logging

In the **System Logging** pane, you can configure system logging in TAS for VMs to forward log messages from TAS for VMs component VMs to an external service. VMware recommends forwarding logs to an external service for use in troubleshooting. If you do not fill these fields, platform logs are not forwarded but remain available on the component VMs and for download through Tanzu Operations Manager.

To configure the **System Logging** pane:

1. Select **System Logging**.
2. Select an option under **Configure syslog for system components?**. **Do not use\*\*** is selected by default. This setting only affects Diego Cell and Gorouter components within the isolation segment. This setting does not affect shared TAS for VMs system components.
3. To use syslog, select **Use**.
4. Enter the address of your external syslog aggregation service in the **Syslog server address** field. The address can be a hostname or IP address.
5. Enter a port number in the **Syslog server port** field.
6. Select a protocol from the **Transport protocol** menu. This is the protocol the system uses to transmit logs to syslog.
7. (Optional) To transmit logs over TLS, select the **Enable TLS** check box.
8. Enter a **Permitted peer**. This is the SHA1 fingerprint of the remote peer.
9. Paste the certificate for your TLS certificate authority (CA) in the **TLS CA certificate** field.
10. (Optional) Activate the **Use TCP for file forwarding local transport** check box to transmit logs over TCP. This prevents log truncation, but might cause performance issues.
11. (Optional) The **Do not forward debug logs** check box is activated by default. To forward **DEBUG** syslog messages to an external service, deactivate the check box.

Some Isolation Segment components generate a high volume of **DEBUG** syslog messages.

Activating the **Do not forward debug logs** check box prevents TAS for VMs components from forwarding the **DEBUG** syslog messages to external services. However, Isolation Segment still writes the messages to the local disk.

12. (Optional) To specify a custom syslog rule, enter it in the **Custom rsyslog configuration** field in RainerScript syntax. For more information about customizing syslog rules, see [Customizing Syslog Rules](#). For more information about RainerScript, see the [RainerScript](#) documentation.
13. (Optional) For **OpenTelemetry Collector Configuration**, the default value is empty, which deactivates the OpenTelemetry Collector.
  - o To configure Isolation Segment to send logs, metrics, and traces using the OpenTelemetry Collector, enter valid OpenTelemetry Collector YAML configuration in this text box. See [Configuring the OpenTelemetry Collector](#) for examples of how to configure OpenTelemetry Collector. Currently Isolation Segment supports a limited number of OpenTelemetry Collector Exporters and Processors.
  - o To use non-GA exporters and processors from the available options, you must enable experimental features by selecting the **Experimental OpenTelemetry Collector features** checkbox.

**Note**

The OpenTelemetry Collector configuration above is supported in Isolation Segment v6.0.13 and later.

**Caution**

If you configure an exporter that listens on a port, ensure that the port is not claimed by a Isolation Segment component on any of the VMs in your deployment.

1. Click **Save**.

## Configure advanced features

The **Advanced Features** pane includes new capabilities that might have certain constraints. Although these features are fully supported, VMware recommends caution when using them in production environments.

### Do not deploy Diego Cells

If you intend to deploy Diego Cells only through one or more isolation segment deployments, use this option to remove all Diego Cells from the TAS for VMs deployment. You might wish to do this to completely separate updates to Diego Cells from updates to the rest of the TAS for VMs deployment.



At least one isolation segment must deploy non-isolated Diego cell VMs so that the TAS for VMs installation has the shared Diego cells that are necessary to host system components that run as apps. Do not deploy app-based system components or run smoke-test errands until the non-isolated Diego cells in these isolation segment deployments are present.

### Diego Cell memory and disk overcommit

If your apps do not use the full allocation of disk space and memory set in the **Resource Config** tab, you might want use this feature. These fields control the amount to overcommit disk and memory resources to each Diego Cell VM.

For example, you might want to use the overcommit if your apps use a small amount of disk and memory capacity compared to the amounts set in the **Resource Config** settings for **Diego Cell**.



Due to the risk of app failure and the deployment-specific nature of disk and memory use, VMware has no recommendation for how much, if any, memory or disk space to overcommit.

To use overcommit:

1. Select **Advanced Features**.
2. In the **Diego Cell memory capacity** field, enter in MB the total desired amount of Diego Cell memory. See the **Diego Cell** row in the **Resource Config** tab for the current Diego Cell memory

capacity settings that this field overrides.

3. In the **Diego Cell disk capacity** field, enter in MB the total desired amount of Diego Cell disk capacity. See the **Diego Cell** row in the **Resource Config** tab for the current Diego Cell disk capacity settings that this field overrides.
4. Click **Save**.



Entries made to each of these two fields set the total amount of resources allocated, not the overage.

## App graceful shutdown period

If your apps require a longer period of time to finish in-flight jobs and gracefully shut down, you can increase the graceful shutdown period. By default, this graceful shutdown period is set to 10 seconds.

When TAS for VMs requests a shutdown of an app, the processes in the container have a period of time to gracefully shut down before the processes are forcefully terminated. For more information, see [Shutdown in App Container Lifecycle](#).

If you significantly increase the value of the graceful shutdown period, platform upgrades and updates might become slower. This is because each Diego Cell uses the graceful shutdown period when it is cleaning up evacuated app instances and waits for each app to gracefully shut down.

VMware recommends using isolation segments to separate apps that have different shutdown requirements to ensure Diego Cell update times are reliable.



To avoid unexpected behavior, you must ensure that **App graceful shutdown period** has the same value in all environments that have deployed apps.

To increase the app graceful shutdown period:

1. Select **Advanced Features**.
2. In the **App graceful shutdown period** field, enter the number of seconds that you want the platform to wait for an app instance to exit after it is signaled to gracefully shut down. The default and minimum value is [10](#).
3. Click **Save**.

## (Optional) Rolling app deployments

You can disallow rolling app deployments. For more information, see [Rolling app deployments](#).

To disallow rolling app deployments:

1. Select **Advanced Features**.
2. Select the **Disallow rolling app deployments** check box.
3. Click **Save**.

## Cloud Controller Worker memory alert threshold

The Cloud Controller Worker generates alerts if memory usage remains above this threshold for three monit cycles. Enter value in MB. The default threshold is 384 MB. Adjust this value if you are seeing excessive alerts.

To adjust this value:

1. Select **Advanced Features**.
2. Enter the desired value in megabytes for **Cloud Controller Worker alert threshold**.
3. Click **Save**.

## Cloud Controller Worker short-term restart threshold

Adjust this value if your foundation's workers are experiencing frequent restarts due to memory pressure. This behavior is intended as a safeguard against anomalies of large memory usage. However, some foundations might have increased memory requirements, depending on database size or other variables. Adjust this value if you are seeing regular worker restarts. Should be higher than [Cloud Controller Worker long-term restart threshold](#)

The Cloud Controller Worker restarts if memory usage stays above this threshold for **three** monit cycles. The default threshold is 512 MB.

To adjust this value:

1. Select **Advanced Features**.
2. Enter the desired value in megabytes for **Cloud Controller Worker short-term restart threshold**.
3. Click **Save**.

## Cloud Controller Worker long-term restart threshold

Adjust this value if your foundation's workers are experiencing frequent restarts due to memory pressure. This behavior is intended as a safeguard against anomalies of large memory usage. However, some foundations might have increased memory requirements, depending on database size or other variables. Adjust this value if you are seeing regular worker restarts. Should be lower than [Cloud Controller Worker short-term restart threshold](#)

The Cloud Controller Worker restarts if memory usage stays above this threshold for **15** monit cycles. The default threshold is 384 MB.

To adjust this value:

1. Select **Advanced Features**.
2. Enter the desired value in megabytes for **Cloud Controller Worker long-term restart threshold**.
3. Click **Save**.

## Cloud Controller Backup and restore health check timeout

The amount of time for health checks to wait to receive a healthy response from the Cloud Controller during a backup and restore before it is declared unhealthy. Adjust this value if Cloud Controller is regularly failing to start up within the timeout after a BBR backup.

To adjust this value:

1. Select **Advanced Features**.
2. Enter the desired timeout value in seconds for **Backup and restore health check timeout**.
3. Click **Save**.

## Cloud Controller Instance File Descriptor limit

Some applications may require usage of a larger number of file descriptors than the default allowed (16384).

To increase the max number of file descriptors provided per application:

1. Select **Advanced Features**.
2. Enter the new number of file descriptors in **Instance File Descriptor Limit**.
3. Click **Save**.

## SMB volume services

Configuring TAS for VMs to deploy SMB volume services allows developers to bind existing SMB shares to their apps for shared file access.

To configure TAS for VMs to deploy SMB volume services:

1. Select **Advanced Features**.
2. Select the **Enable SMB volume services** check box.
3. Click **Save**.
4. Select **Errands**.
5. Set the **SMB Broker Errand** to **On**.
6. Click **Save**.

For more information about SMB volume services, see [Enabling volume services](#).

## Configure compute and networking Isolation

In the **Compute and Networking Isolation** pane, you can activate or deactivate compute isolation and configure Gorouter sharding for isolation segments.

Compute isolation is when an app runs on compute resources, such as clusters, resource pools, and servers, that are isolated from other resources by a network partition or firewall.

Networking isolation, or Gorouter sharding, is when traffic to an app instance uses a dedicated route that is isolated from routes used by other app instances by a network partition or firewall rule.

In the Isolation Segment tile, you cannot deactivate compute isolation and activate networking isolation at the same time. This is because networking isolation configures the route by which traffic goes to the Isolation Segment tile. Both compute and networking isolation are activated by default.

### Options for configuring compute and networking isolation

The following table describes the ways VMware recommends configuring the **Compute and Networking Isolation** pane and the **Requests to isolation segments** property in the **Networking** pane of the TAS for VMs tile:

Use case	Compute isolation	Gorouter sharding mode	Requests to isolation segments	Other requirements	Scaling recommendations
Use compute isolation and network isolation	Enabled	Isolation segment only	Reject requests for all isolation segments	Isolation Segment has its own load balancer and uses a different domain from TAS for VMs	Apps in the isolation segment can have their own Diego Cells and Gorouters.
Use compute isolation and extra Isolation Segment Gorouters	Enabled	Isolation segment only	Accept requests for all isolation segments	Isolation Segment has its own load balancer and uses the same domain as TAS for VMs	Apps in the isolation segment can have their own Diego Cells and Gorouters.
Use compute isolation only	Enabled	No isolation segment	Accept requests for all isolation segments	Isolation Segment uses TAS for VMs load balancer and domain	Scale Isolation Segment Gorouters to 0.
Use network isolation in some cases	See other rows for guidance	See other rows for guidance	Accept requests for some isolation segments	See other rows for guidance	See other rows for guidance

The use cases from the previous table are described here:

- **Use compute isolation and network isolation for all isolation segments:** This is the most common case. For this use case, select **Reject requests for all isolation segments** for the **Requests to isolation segments** radio button in the **Networking** pane of the TAS for VMs tile. This configuration routes traffic between an isolation segment and a block of compute resources that is dedicated solely to that isolation segment. It also ensures that no traffic is routed through the TAS for VMs Gorouters.
- **Use compute isolation and extra Isolation Segment Gorouters:** To configure traffic for your isolated apps to pass through the Gorouters for both Isolation Segment and TAS for VMs, activate compute isolation and networking isolation, and select **Accept requests for all isolation segments** for the **Requests to isolation segments** radio button in the **Networking** pane of the TAS for VMs tile. You can also use either the same apps domain you configured in the **Domains** pane of the TAS for VMs tile, or a different domain that you configure with the DNS for the load balancer for the Isolation Segment Gorouters. This configuration is useful if you want to configure isolated compute resources for your apps but do not have additional networking restrictions.
- **Use compute isolation only:** To configure the TAS for VMs load balancer and apps domain route requests from your isolated apps, you can activate compute isolation, deactivate networking isolation, and select **Accept requests for all isolation segments** for **Requests to isolation segments** in the **Networking** pane of the TAS for VMs tile. This configuration allows you to move Diego Cells out of TAS for VMs and into isolation segments, so you can upgrade TAS for VMs first and your Isolation Segment tiles as time permits. This allows you to upgrade a large foundation in pieces, making it easier to upgrade within scheduled maintenance windows. This configuration is useful if your foundation has additional compute resource blocks, but no additional Gorouters for Isolation Segment configured in the **Resource Config** pane.
- **Use network isolation in some cases:** For this use case, in **Requests to isolation segments** (**Networking** pane), select **Accept requests for some isolation segments** TAS for VMs tile. Then

provide a comma-separated list of Isolation Segment names that Gorouters accept traffic to. See other cases for guidance on how to configure each Isolation Segment. **Compute and Networking Isolation** pane and **Requests to isolation segments** setting in the TAS for VMs tile in a manner other than the use cases described here, the smoke tests fail. To deploy the tile anyway, you must deactivate the Smoke Test errand in the **Errands** pane of the TAS for VMs tile. VMware does not recommend deactivating smoke tests. To configure the Smoke Test errand, see [Configure Errands](#).

## Configure compute and networking isolation pane

To configure the **Compute and Networking Isolation** pane:

1. Select **Compute and Networking Isolation**.
2. Under **Compute isolation**, activate or deactivate compute isolation:
3. To deactivate compute isolation, select **Do not allow**. Select this option if you do not require compute isolation and you are deploying the Isolation Segment tile for the purpose of making upgrades more manageable. For example, if you have a TAS for VMs tile with a large volume of Diego Cells. This approach helps separate the upgrade of the TAS for VMs control plane from the upgrade of the Diego Cells. Further, it splits the upgrade of the Diego Cells into smaller groups.
4. To activate compute isolation, select **Allow** and enter a placement tag for your Diego Cells in the **Segment name** field. This placement tag identifies the Diego Cells that run in your isolation segment and does not have to be unique across your Operations Manager deployment. You use this placement tag when following the steps in [Register an isolation segment](#) in *Managing isolation segments* to create the isolation segment in the CCDB.

If you deactivate compute isolation, you must set **Gorouter sharding mode to No isolation segment**. Otherwise, the Isolation Segment tile fails to schedule the apps in your isolation segment.

5. Under **Networking isolation**, activate or deactivate networking isolation by selecting a sharding mode. For more information, see [Sharding Gorouters for isolation segments](#) in *Routing for isolation segments*.
6. **Isolation segment only:** The Gorouters for the TAS for VMs tile acknowledge requests only for apps deployed within the Diego Cells of the tile. All other requests fail.
7. **No isolation segment:** The Gorouters for the TAS for VMs tile reject requests for any isolation segment. Choose this option to add a group of Gorouters for the TAS for VMs tile, such as when you want a private point of entry for the system domain or to configure a group of Gorouters to receive requests from your corporate intranet.

## Configure smoke tests

In the **Smoke Tests** pane, you specify the org and space where smoke tests are run. In the org and space that you specify, the Smoke Test errand pushes the app to a Operations Manager org. The app runs basic functionality tests against both the TAS for VMs and Isolation Segment tiles after an installation or update.

The Smoke Test errand verifies that your deployment can:

- Push, scale, and delete apps
- Create and delete orgs and spaces

The Smoke Test errand is on by default. You can turn off the Smoke Test errand in the **Errands** pane. For more information, see [Configure Errands](#).

To configure the **Smoke Tests** pane:

1. Select **Smoke Tests**.
2. (Optional) In **Domain**, enter the name of the apps domain that Isolation Segment uses when pushing an app to run smoke tests.
3. To configure routing from the isolation segment to either the TAS for VMs or Isolation Segment Gorouters, enter the apps domain you configured in the **Domains** pane of the TAS for VMs tile.
4. To configure separate routing for the isolation segment, enter a different apps domain.
5. If you have a shared apps domain, select **A temporary space within the system org**, which creates a temporary space within the system org for running smoke tests and deletes the space afterwards. Otherwise, select **A specified org and space** and complete these fields to configure where Isolation Segment pushes an app to run smoke tests:
6. For **Org**, enter the org Isolation Segment uses when pushing an app to run smoke tests.
7. For **Space**, enter the space Isolation Segment uses when pushing an app to run smoke tests.
8. Click **Save**.



### Important

If you configure the **Compute and Networking Isolation** pane and the **Requests to isolation segments** property in the TAS for VMs tile in a manner other than the use cases described in [Options for Configuring Compute and Networking Isolation](#), the smoke tests fail.

## Configure errands

Errands are scripts that Tanzu Operations Manager runs automatically when it installs or uninstalls a product, such as a new version of TAS for VMs. There are two types of errands: *post-deploy errands* run after the product is installed, and *pre-delete errands* run before the product is uninstalled.

By default, Tanzu Operations Manager always runs all errands.

In the **Errands** pane, you can select **On** to always run an errand or **Off** to never run it.

For more information about how Tanzu Operations Manager manages errands, see [Managing Errands in Tanzu Operations Manager](#).

You must deactivate the Smoke Test errand if:

- You configure the **Compute and Networking Isolation** pane and the **Requests to isolation segments** check box in the TAS for VMs tile in a manner other than the use cases described in [Options for Configuring Compute and Networking Isolation](#). Otherwise, apps fail to schedule in Isolation Segment.
- Both the V2 and V1 Firehoses are deactivated in TAS for VMs. Otherwise, the deploy fails.

## Configure resources

In the **Resource Config** pane, you must associate load balancers with the VMs in your deployment to activate traffic.

To configure the **Resource Config** pane:

1. Select **Resource Config**.
2. If you use a dedicated Gorouter for your isolation segment:

The configuration settings available in **Resource Config** vary depending on your IaaS.

If you have the Load Balancers column in your Resource Config pane:

Enter the wildcard DNS entry attached to your load balancer into the Router row under Load Balancers.

If you do not have the Load Balancers column in your Resource Config pane:

1. Go to the Networking pane.
2. Specify Gorouter IPs.
3. Manually attach the IP addresses to your load balancer.

## After tile configuration

After you configure the Isolation Segment tile:

1. Register the isolation segment in the CCDB by following the procedure in [Register an isolation segment](#) in *Managing isolation segments*.

If you run smoke tests as a post-deploy errand in the Isolation Segment tile, the smoke tests check if your isolation segment is registered in the Cloud Controller database (CCDB). If not, the smoke tests register it in the CCDB. This eliminates the need to manually register the isolation segment with the `cf create-isolation-segment` command. For more information about running smoke tests, see [Configure Smoke Tests](#).

2. Return to the Tanzu Operations Manager Installation Dashboard.
3. Click **Review Pending Changes**, then **Apply Changes** to deploy the tile.

After the tile finishes deploying, see [Managing isolation segments](#) for more information about managing an isolation segment.

## Step 4: Copy the tile (optional)

To create multiple isolation segments, you can copy the Isolation Segment tile with the Replicator tool.

To create multiple isolation segments:

1. Download the Replicator tool from the [Isolation Segment](#) page of Broadcom Support.
2. Go to the directory where you downloaded the Replicator tool.
3. Replicate the tile by running:

```
./replicator \
    --name "TITLE-NAME" \
    --path /PATH/TO/ORIGINAL.pivot \
    --output /PATH/TO/COPY.pivot
```

Where:

- `TILE-NAME` is a unique name you provide for the new Isolation Segment tile. The name must be ten characters or less and only contain alphanumeric characters, dashes, underscores, and spaces.
- `/PATH/TO/ORIGINAL.pivot` is the absolute path to the original Isolation Segment tile you downloaded from Broadcom Support.
- `/PATH/TO/COPY.pivot` is the absolute path for the copy that the Replicator tool produces.

4. Follow the procedures in this topic using the new `.pivot` file, starting with **Step 1**.

## Upgrading replicated tiles

For information about upgrading replicated Isolation Segment tiles, see [Upgrading Replicated Tiles](#) in *Upgrading TAS for VMs and Other Operations Manager Products*.

## Managing Isolation Segments in TAS for VMs

With TAS for VMs, you can isolate deployment workloads into dedicated resource pools called isolation segments.

### Isolation Segments overview

To enable isolation segments, an operator must install the Isolation Segment tile by performing the procedures in [Installing Isolation Segment](#). Installing the tile creates a single isolation segment.

After an admin creates a new isolation segment, the admin can then create and manage relationships between the orgs and spaces of a VMware Tanzu Application Service for VMs (TAS for VMs) deployment and the new isolation segment.

## Requirements

Target the API endpoint of your deployment with `cf api` and log in with `cf login` before performing the procedures in this topic. For more information, see [Identifying the API Endpoint for Your TAS for VMs Instance](#).

## Register an isolation segment

To register an isolation segment in the Cloud Controller database (CCDB), use the cf CLI.

If you run smoke tests as a post-deploy errand in the Isolation Segment tile, the smoke tests check if your isolation segment is registered in the CCDB. If the isolation segment is not registered, the smoke tests register it in the CCDB. This eliminates the need to manually register an isolation segment with `cf create-isolation-segment`.

To register an isolation segment in the CCDB:

1. Log in to your deployment by running:

```
cf login
```

- Run:

```
cf create-isolation-segment SEGMENT-NAME
```

Where `SEGMENT-NAME` is the name you give your isolation segment.



The isolation segment name used in the `cf` CLI command must match the value specified in the **Segment name** field of the Isolation Segment tile. If the names do not match, Tanzu Operations Manager fails to place apps in the isolation segment when apps are started or restarted in the space assigned to the isolation segment.

If successful, the command returns an `OK` message:

```
Creating isolation segment SEGMENT-NAME as admin...
OK
```

## Retrieve isolation segment information

The `cf isolation-segments`, `cf org`, and `cf space` commands retrieve information about isolation segments. The isolation segments you can see depends on your role:

- Admins** see all isolation segments in the system.
- Other users** only see the isolation segments that their orgs are entitled to.

### List isolation segments

To see a list of the isolation segments that are available to you:

- Log in to your deployment by running:

```
cf login
```

- Run:

```
cf isolation-segments
```

The command returns results similar to this example output:

```
Getting isolation segments as admin...
OK
name          orgs
SEGMENT-NAME  org1, org2
```

### Display isolation segments enabled for an org

An admin can entitle an org to multiple isolation segments.

To view the isolation segments that are available to an org:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf org ORG-NAME
```

Where `ORG-NAME` is the name of your org.

The command returns results similar to this example output:

```
Getting info for org ORG-NAME as user@example.com...
name:          ORG-NAME
domains:       example.com, apps.example.com
quota:         paid
spaces:        development, production, sample-apps, staging
isolation segments: SEGMENT-NAME, OTHER-SEGMENT-NAME
```

## Showing the isolation segment assigned to a space

Only one isolation segment can be assigned to a space.

To view the isolation segment assigned to a space:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf space SPACE-NAME
```

Where `SPACE-NAME` is the name of the space to which your isolation segment is assigned.

The command returns results similar to this example output:

```
name:          staging
org:           ORG-NAME
apps:
services:
isolation segment: SEGMENT-NAME
space quota:
security groups: dns, p-mysql, p.mysql, public_networks, rabbitmq,
ssh-logging
```

## Deleting an isolation segment

An isolation segment with deployed apps cannot be deleted.

Only admins can delete isolation segments.

To delete an isolation segment:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf delete-isolation-segment SEGMENT-NAME
```

Where `SEGMENT-NAME` is the name of the isolation segment you want to delete.

If successful, the command returns an `OK` message:

```
$ cf delete-isolation-segment SEGMENT-NAME
Deleting isolation segment SEGMENT-NAME as admin...
OK
```

## Managing isolation segment relationships

The commands listed in the following sections manage the relationships between isolation segments, orgs, and spaces.

### Enabling an org to use isolation segments

Only admins can enable orgs to use isolation segments.

To enable the use of an isolation segment:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf enable-org-isolation ORG-NAME SEGMENT-NAME
```

Where:

- `ORG-NAME` is the name of your org.
- `SEGMENT-NAME` is the name of the isolation segment you want your org to use.

If an org is entitled to use only one isolation segment, that isolation segment does not automatically become the default isolation segment for the org. You must explicitly set the default isolation segment of an org. For more information, see [Set the Default Isolation Segment for an Org](#).

### Deactivating an org from using isolation segments

You cannot deactivate an org from using an isolation segment if a space within that org is assigned to the isolation segment. Additionally, you cannot deactivate an org from using an isolation segment if the isolation segment is configured as the default for that org.

To deactivate an org from using an isolation segment:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf disable-org-isolation ORG-NAME SEGMENT-NAME
```

Where:

- **ORG-NAME** is the name of your org.
- **SEGMENT-NAME** is the name of the isolation segment you want to deactivate the org from using.

If successful, the command returns an **OK** message:

```
Removing entitlement to isolation segment SEGMENT-NAME from org org1 as admin...
```

```
OK
```

## Setting the default isolation segment for an org

This section requires cf CLI v6.29.0 or later. To download cf CLI v6.29.0 or later, go to the [Releases](#) section of the Cloud Foundry CLI repository on GitHub.

Only admins and org managers can set the default isolation segment for an org.

When an org has a default isolation segment, apps in the spaces belong to the default isolation segment unless you assign them to another isolation segment. You must restart running apps to move them into the default isolation segment.

To set the default isolation segment for an org:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf set-org-default-isolation-segment ORG-NAME SEGMENT-NAME
```

Where:

- **ORG-NAME** is the name of your org.
- **SEGMENT-NAME** is the name of the isolation segment you want to set as your org's default.

If successful, the command returns an **OK** message:

```
$ cf set-org-default-isolation-segment org1 SEGMENT-NAME
Setting isolation segment SEGMENT-NAME to default on org org1 as admin...
OK
```

To display the default isolation segment for an org:

1. Run:

```
cf org
```

## Assign an isolation segment to a space

Admins and org managers can assign an isolation segment to a space. Apps in that space start in the specified isolation segment.

To assign an isolation segment to a space, you must first activate the space's org to use the isolation segment. For more information, see [Enable an Org to Use Isolation Segments](#).

To assign an isolation segment to a space:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf set-space-isolation-segment SPACE-NAME SEGMENT-NAME
```

Where:

- **SPACE-NAME** is the name of your space.
- **SEGMENT-NAME** is the name of the isolation segment you want to assign to your space.

## Resetting the isolation segment assignment for a space

Admins can reset the isolation segment assigned to a space to use the org's default isolation segment.

To assign the default isolation segment for an org to a space:

1. Log in to your deployment by running:

```
cf login
```

2. Run:

```
cf reset-space-isolation-segment SPACE-NAME
```

Where **SPACE-NAME** is the name of the space to which you want to assign your org's default isolation segment.

## Routing for isolation segments in TAS for VMs

You can configure and manage routing for isolation segments in TAS for VMs as described in this topic. You can also deploy a set of Gorouters for each isolation segment to handle requests for apps within the segment.

For more information about how isolation segments work, see [Isolation Segments in TAS for VMs Security](#). For more information about creating isolation segments, see [Installing Isolation Segment](#).

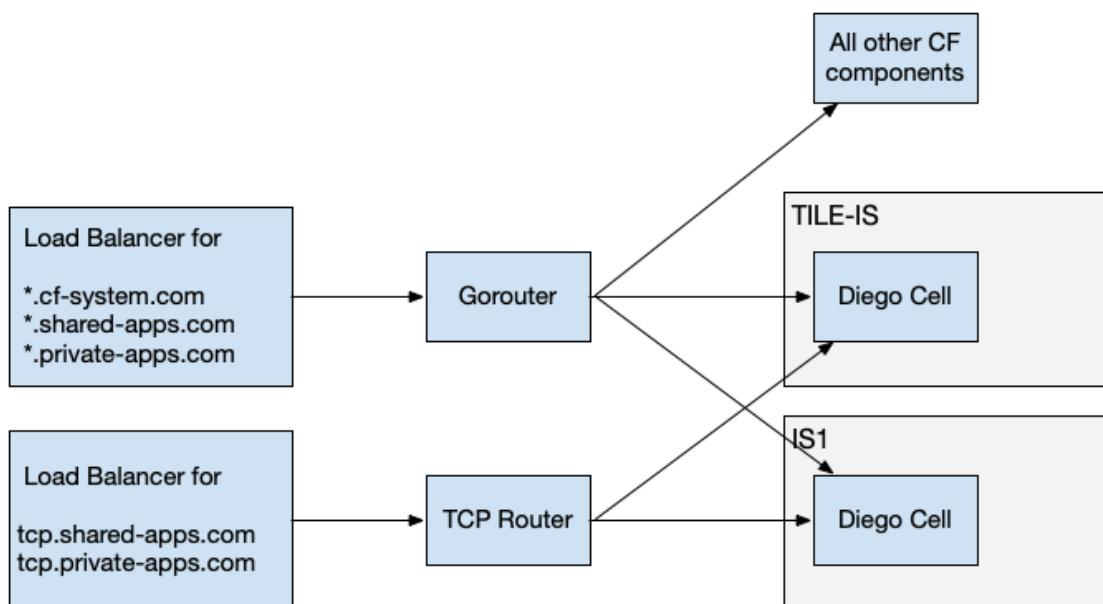
The instructions in this topic assume you are using Google Cloud Platform (GCP). The procedures can differ on other IaaSes, but the concepts must be transferable.

## Isolation segments overview

Isolation segments isolate the compute resources for one group of apps from another. However, these apps still share the same network resources. Requests for apps on all isolation segments, as well as for system components, transit the same load balancers, TAS for VMs Gorouters, and TAS for VMs TCP Routers.

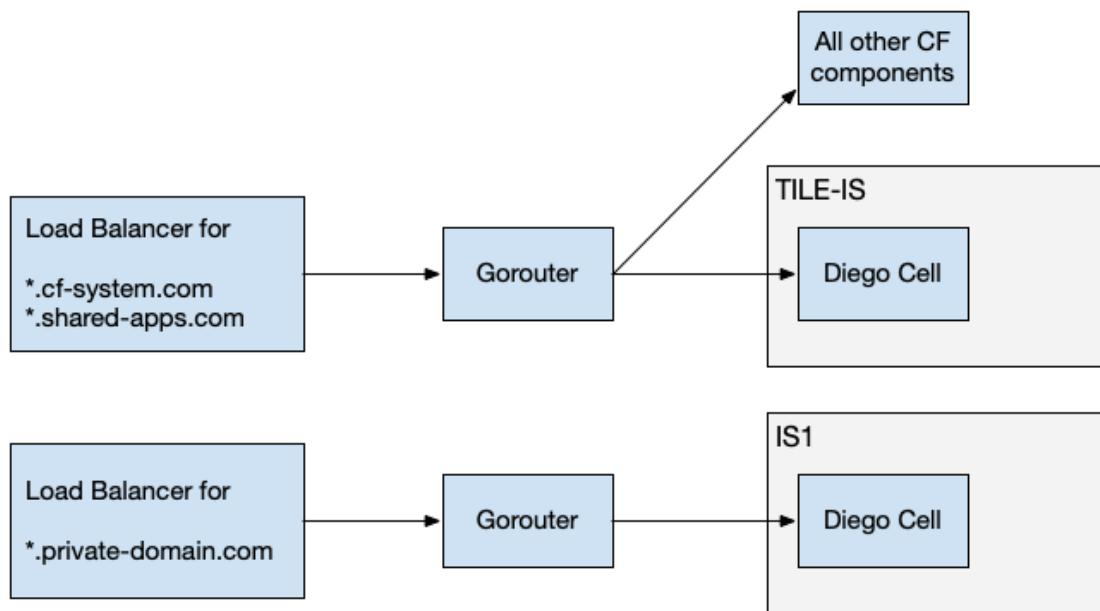
When you use isolation segments, TAS for VMs designates its Diego Cells as belonging to an isolation segment called `shared`. This isolation segment is the default isolation segment assigned to every org and space. This can be overwritten by assigning an explicit default for an organization. For more information about creating isolation segments, see [Installing Isolation Segment](#).

The following illustration shows isolation segments sharing the same network resources:



The two isolation segments each contain a single Diego Cell. These isolation segments use the same Gorouter, TCP Router, and load balancers.

Operators who want to prevent all isolation segments and system components from using the same network resources can deploy an additional set of Gorouters for each isolation segment:



The two isolation segments each use separate Gorouters and Diego Cells. However, the use of an isolated TCP router in this scenario is not supported.

Use cases include:

- Requests for apps in an isolation segment must not share networking resources with requests for other apps.
- The TAS for VMs management plane can only be accessible from a private network. As multiple IaaS load balancers cannot typically share the same pool of back ends, such as TAS for VMs Gorouters, each load balancer requires an additional deployment of Gorouters.

## Step 1: Create networks

Create a network or subnet for each isolation segment on your infrastructure. For example, an operator who wants one isolation segment separated from their TAS for VMs Diego Cells could create one network named `sample-network` with two subnets named `sample-subnet-tas` and `sample-subnet-is1`.

The following diagram describes the network topology:

```

IaaS network: sample-network
|
|____ IaaS subnet: sample-subnet-tas
|
|____ IaaS subnet: sample-subnet-is1

```

Subnets do not generally span IaaS availability zones (AZs), so the same operator with two AZs needs four subnets.

```

IaaS network: sample-network
|
|____ IaaS subnet: sample-subnet-tas-az1

```

```

|____ IaaS subnet: sample-subnet-tas-az2
|
|____ IaaS subnet: sample-subnet-is1-az1
|
|____ IaaS subnet: sample-subnet-is1-az2

```

For more information about networks and subnets in GCP, see [Using Networks and Firewalls](#) in the GCP documentation.

## Step 2: Configure networks for Gorouters

To configure the subnets with BOSH, use BOSH cloud config subnets. Each subnet in the IaaS must correspond to a BOSH subnet that is labeled with the correct isolation segment. For more information, see [Usage](#) in the BOSH documentation.

Go to the **Assign AZs and Networks** pane of the Isolation Segment tile to assign your isolation segment to the network you created in Step 1. For more information, see [Step 3: Configure the Tile](#) in *Installing Isolation Segment*.

## Step 3: Configure additional Gorouters

Go to the **Resource Config** pane of the Isolation Segment tile and use the dropdown to set your **Router** instances to a number greater than zero. For more information, see [Step 3: Configure the Tile](#) in *Installing Isolation Segment*.

## Step 4: Add Gorouters to load balancer

If your IaaS supports it, go to the **Resource Config** pane of the Isolation Segment tile and enter the name of your load balancer under **Load Balancers**. For more information, see [Step 3: Configure the Tile](#) in *Installing Isolation Segment*. If your IaaS does not support this configuration, you must create static IP addresses and assign them to your load balancer out of band.

## Step 5: Configure DNS and load balancers

Create a separate domain name for each Gorouter instance group, and configure DNS to resolve these domain names to a load balancer that routes requests to the matching Gorouters.

You must configure your load balancers to forward requests for a given domain to one Gorouter instance group only.

As Gorouter instance groups might be responsible for separate isolation segments, and an app might be deployed to only one isolation segment, requests can only reach a Gorouter that has access to the apps for that domain name. Load balancing requests for a domain across more than Gorouter instance group can result in request failures unless all the Gorouter instance groups have access to the isolation segments where apps for that domain are deployed.

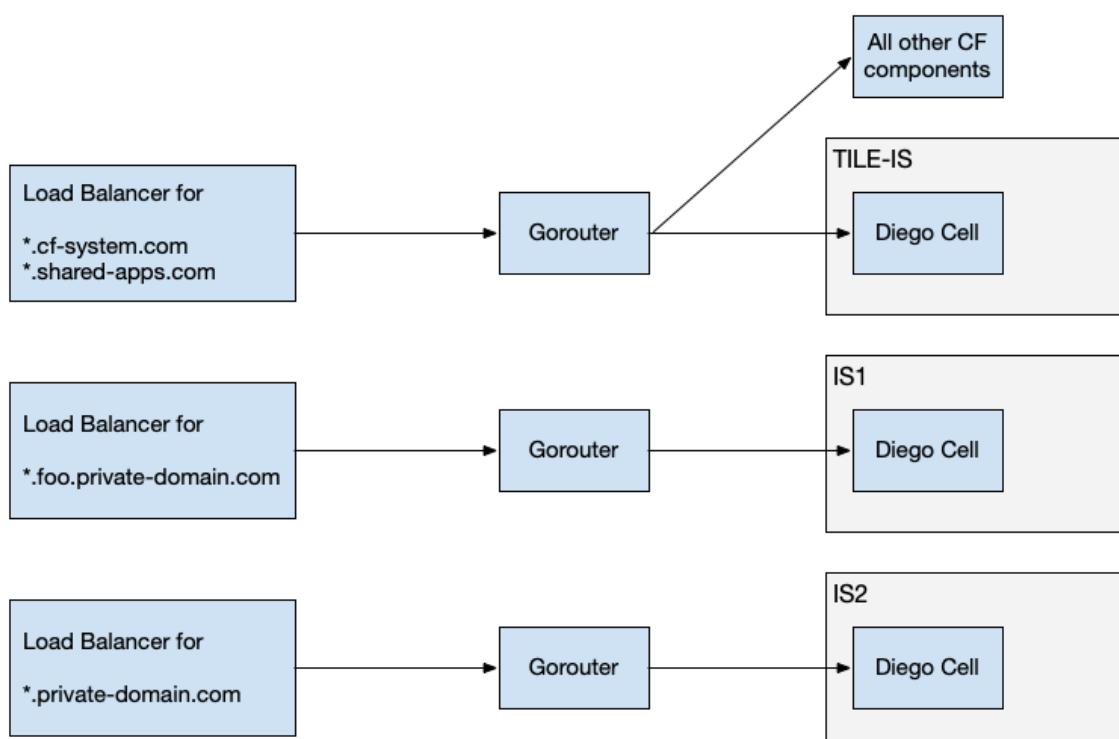
### Shared domain name

It is a common requirement for apps on separate isolation segments to be accessible at domain names that share a domain. For example, `private-domain.com`. To achieve this configuration while also obeying the guideline for forwarding requests for a domain to only one Gorouter instance group, create a new TAS for VMs domain for a needed subdomain, such as `*.foo.private-domain.com`.

The diagrams illustrate a topology with separate load balancers, but you could also use one load balancer with multiple interfaces.

In this configuration:

- Requests for system domain `*.cf-system.com` and the shared domain `*.shared-apps.com` are forwarded to the Gorouters for the TAS for VMs Diego Cells.
- Requests for private domain `*.foo.private-domain.com` are forwarded to the Gorouters for IS1. Requests for private domain `*.private-domain.com` are forwarded to the Gorouters for IS2.



The example has three isolation segments and three Gorouters.

The three isolation segments each use separate Gorouters and load balancers.

## Step 6: Configure firewall rules

Configure firewall rules to allow for necessary ingress and egress traffic for isolation segments and TAS for VMs Diego Cells. Assuming a default deny-all rule, properly configuring firewall rules prevents a request with a spoofed Host header from being forwarded by a Gorouter to an app in a different isolation segment.

Firewall rules are specific to each IaaS, so the exact definition of `Source` and `Destination` depends on the IaaS. For example:
 

- \* On GCP, a `Source` is a subnet and a `Destination` is a tag.
- \* On AWS, both `Source` and `Destination` are security groups.

To configure firewall rules for isolation segment traffic:

1. Configure the firewall rules in the table below:

For information about the processes that use these ports and their corresponding manifest properties, see [Port Reference Table](#).

Rule Name	Source	Allowed Protocols/Ports	Destination	Reason
tas-to-bosh	TAS for VMs Diego Cells	<code>tcp:4222, 25250, 25777</code>	BOSH Director	BOSH Agent on VMs in the TAS for VMs Diego Cells to reach BOSH Director
tas-internal	TAS for VMs Diego Cells	<code>tcp:any, udp:any, icmp:any</code>	TAS for VMs Diego Cells	VMs within the TAS for VMs Diego Cells to reach one another
tas-to-is1	TAS for VMs Diego Cells	<code>tcp:1801, 8853, 53035</code>	Isolation segment	Diego BBS in TAS for VMs Diego Cells to reach Diego Cells in isolation segment
is1-to-bosh	Isolation segment	<code>tcp:4222, 25250, 25777</code>	BOSH Director	BOSH Agent on VMs in isolation segment to reach BOSH Director
is1-internal	Isolation segment	<code>tcp:all, udp:all, icmp:all</code>	Isolation segment	VMs within isolation segment to reach one another
is1-to-tas	Isolation segment	<code>tcp:3000, 3001, 4003, 4103, 4222, 4224, 4443, 6067, 8080, 8082, 8083, 8443, 8447, 8844, 8853, 8889, 8891, 9000, 9022, 9023, 9090, 9091</code>	TAS for VMs Diego Cells	Diego Cells in isolation segment to reach Diego BBS, Diego Auctioneer, and CredHub in TAS for VMs. Loggregator Agent to reach Doppler. Syslog Agent to reach Log Cache Syslog Server. Gorouters to reach NATS, UAA, and Routing API. Metrics Discovery Registrar to reach NATS.

2. (Optional) Configure the firewall rules in the following table:

Rule Name	Source	Allowed Protocols/Ports	Destination	Reason
jumpbox-to-is1	Jumpbox VM	<code>tcp:22</code>	Isolation segment	Jumpbox VMs to reach isolation segment through SSH or BOSH SSH.

Rule Name	Source	Allowed Protocols/Ports	Destination	Reason
diego-cell-egress	Diego Cell VM on isolation segment	tcp:any, udp:any	Internet	If Diego Cells must download buildpacks to stage apps, allow egress traffic from all Diego Cell VMs on isolation segments to reach the Internet.

Additional firewall rules might be necessary to allow logs to egress to application syslog drains.

Connections for syslog drains are initiated both from Diego Cells and Routers.

For more information about ports used by agents to communicate with BOSH, see the [bosh-deployment](#) repository on GitHub.

For more information about networks and firewall rules for GCP, see [Using Subnetworks](#) in the GCP documentation.

## Port Reference Table

To understand which protocols and ports map to which processes and manifest properties for the preceding rules, see the following table:

Protocol	Port	Process	Manifest Property
tcp	1801	Diego Rep	diego.rep.listen_addr_securable
tcp	3000	Routing API	routing_api.port
tcp	3001	Routing API	routing_api.mtls_port
tcp	4003	VXLAN Policy Agent	cf_networking.policy_server.internal_listen_port
tcp	4103	Silk Controller	cf_networking.silk_controller.listen_port
tcp	4222	NATS	nats.nats.port
tcp	4224	NATS	nats-tls.nats.port
tcp	4443	CAPI Blobstore Port - HTTPS	capi.blobstore.tls.port
tcp	6067	Log Cache Syslog Server	log-cache.log-cache-syslog-server.syslog_port
tcp	8080	CAPI Blobstore Port - HTTP, Diego file server - HTTP	capi.blobstore.port, diego.file_server.listen_addr
tcp	8082	Doppler gRPC, Reverse Log Proxy Gateway	loggregator.doppler.grpc_port, loggregator.reverse_log_proxy.egress.port
tcp	8083	Log Cache cf-auth-proxy	log-cache.log-cache-cf-auth-proxy.proxy_port
tcp	8084	Diego file server - HTTP	diego.file_server.listen_addr
tcp	8443	UAA	uaa.uaa.ssl.port
tcp	8447	Diego file server - HTTPS	diego.file_server.https_listen_addr

Protocol	Port	Process	Manifest Property
tcp	8844	CredHub	credhub.credhub.port
tcp	8853	BOSH DNS health	health.server.port from bosh-dns-release
tcp	8889	Diego BBS	diego.rep.bbs.api_location
tcp	8891	Diego Database (Locket)	diego.locket.listen_addr
tcp	9000	Loggregator Syslog Binding Cache	loggr-syslog-binding-cache.external_port
tcp	9022	Cloud Controller Stager	capi.stager.cc.external_port
tcp	9023	Cloud Controller TPS	capi.tps.cc.external_port
tcp	9090	Cloud Controller Uploader	capi.cc_uploader.http_port
tcp	9091	Cloud Controller Uploader	capi.cc_uploader.https_port
tcp	53035	System Metrics Scraper	system-metrics-scraper.loggr-system-metric-scraper.scrape_port
tcp	25250	BOSH Blobstore	bosh.blobstore.port
tcp	25777	BOSH Registry	bosh.registry.port

## Additional GCP information

For more information, see [Understanding backend services](#) in the GCP documentation and the [BOSH Google CPI Release](#) repository on GitHub.

## Sharding Gorouters for isolation segments

You can configure Gorouter sharding for isolation segments depending on your use case:

Use Case	Description	How to Configure
Securing apps that run in an isolation segment	To provide security guarantees in addition to the firewall rules described above, you can configure sharding of the Gorouter's routing table, resulting in a Gorouter dedicated to an isolation segment that only recognizes routes for apps in the same isolation segment.	<ol style="list-style-type: none"> <li>In the <b>Networking</b> pane of the TAS for VMs tile, select <b>Reject all</b> under <b>Requests to isolation segments</b>.</li> <li>In the Isolation Segment tile, select <b>Isolation segment only</b> under <b>Networking isolation</b>.</li> </ol>
Deploying additional Gorouters for TAS for VMs	The flexibility of the configuration also supports deployment of a Gorouter that excludes all isolation segments.	<ol style="list-style-type: none"> <li>In the <b>Networking</b> pane of the TAS for VMs tile, select <b>Reject all</b> under <b>Requests to isolation segments</b>.</li> <li>In the Isolation Segment tile, select <b>No isolation segment</b> under <b>Networking isolation</b>.</li> </ol>

**Note**

For compute isolation only, you can select **Accept all** under **Requests to isolation segments** in the **Networking** pane of the TAS for VMs tile. This is the default setting, which does not require any additional Gorouters for the Isolation Segment tile.

## Metrics for Gorouters associated with isolation segments

For metrics emitted by the Gorouter, metrics can be distinguished by the name of the job. For example, this line is a metric emitted on `uptime`:

```
origin:"gorouter" eventType:ValueMetric timestamp:1491338040750977602 deployment:"superman.cf-app.com" job:"router_is1" index:"9a4b639c-8f0e-4b2b-b332-4161ee4646e6" ip:"10.0.16.23" valueMetric:<name:"uptime" value:118 unit:"seconds" >
```

## Upgrading TAS for VMs

In this section:

- [Configuring TAS for VMs for upgrades](#)
- [What happens during TAS for VMs upgrades](#)
- [cf push availability during TAS for VMs upgrades](#)

## Configuring TAS for VMs for upgrades

Here are several configuration options for VMware Tanzu Application Service for VMs (TAS for VMs) that can help ensure successful upgrades. In addition to following the [Upgrade Preparation Checklist](#), review this topic to better understand how to prepare for TAS for VMs upgrades.

**Caution**

If you are upgrading from v6.0.5 or v6.0.6 to a later patch version, upgrade TAS for VMs and apply those changes before you upgrade TAS for VMs [Windows]. Failure to upgrade TAS for VMs first will result in TCP route outages on TAS for VMs [Windows].

For more information, see [Downtime for TCP Routes When Upgrading IST, TASW, and Services Tiles before TAS in TPCF](#) in the Broadcom Support Knowledge Base.

## Limit component instance restarts

The `max_in_flight` variable limits how many instances of a component can restart simultaneously during updates or upgrades. Increasing the value of `max_in_flight` can make updates run faster, but setting it too high risks overloading VMs and causing failure. For guidance on setting `max_in_flight` values, see [Basic Advice](#).

Values for `max_in_flight` can be any integer between 1 and 100, or a percentage of the total number of instances. For example, a `max_in_flight` value of `20%` in a deployment with 10 Diego Cell instances can

make no more than two Diego Cell instances restart at once.

## Set max\_in\_flight

The `max_in_flight` variable is a system-wide value with optional component-specific overrides. You can override the default value for individual jobs using an API endpoint.

### Use the max\_in\_flight API endpoint

Use the `max_in_flight` API endpoint to configure the maximum value for component instances that can start at a given time. This endpoint overrides product defaults. You can specify values as a percentage or an integer.

Use the string `default` as the `max_in_flight` value to force the component to use the deployment's default value.

The following example lists three `JOB_GUIDS`. These three GUIDs are examples of the three different types of values you can use to configure `max_in_flight`. The endpoint only requires one GUID.

```
curl "https://EXAMPLE.com/api/v0/staged/products/PRODUCT-TYPE1-GUID/max_in_flight" \
-X PUT \
-H "Authorization: Bearer UAA_ACCESS_TOKEN" \
-H "Content-Type: application/json" \
-d '{
    "max_in_flight": {
        "JOB_1_GUID": 1,
        "JOB_2_GUID": "20%",
        "JOB_3_GUID": "default"
    }
}'
```

## Guidance for Diego Cells

To upgrade TAS for VMs, BOSH must drain all Diego Cell VMs that host app instances. BOSH manages this process by upgrading a batch of Diego Cells at a time.

The number of Diego Cells that undergo an upgrade simultaneously (either in a state of shutting down or coming back online) is controlled by the `max_in_flight` value of the Diego Cell job. For example, if `max_in_flight` is set to `10%` and your deployment has 20 Diego Cell job instances, then the maximum number of Diego Cells that BOSH can upgrade at a single time is `2`.

When BOSH triggers an upgrade, each Diego Cell undergoing upgrade enters “evacuation” mode. Evacuation mode relates to the Diego Cell stop accepting new work and signals the rest of the Diego system to schedule replacements for its app instances. This scheduling is managed by the Diego auctioneer process. For more information, see [How Diego Balances App Processes](#).

The evacuating Diego Cells continue to interact with the Diego system as replacements come online. The Diego Cell undergoing upgrade waits until either its app instance replacements run successfully or the evacuation process timesout before shutting down the original local instances. This “evacuation timeout” defaults to 10 minutes.

If Diego Cell evacuation exceeds this timeout, then the Diego Cell stops its app instances and shuts down. The Diego system continues to re-emit start requests for the app replacements.

### Prevent overload

A potential issue arises if too many app instance replacements are slow to start or do not start successfully at all.

If too many app instances are starting concurrently, then the load of these starts on the rest of the system can cause other apps that are already running to crash and be rescheduled. These events can result in a cascading failure.

To prevent this issue, TAS for VMs provides two throttle configurations:

- The maximum number of in-flight Diego Cell instances.
- The maximum number of starting containers.

The values of the throttle configurations depend on the version of TAS for VMs that you have deployed and whether you have overridden the default values.

The following list describes the existing defaults for determining the override values in your deployment:

- **Starting container count maximum:** 200
- **Starting container count overridable:** Yes
- **Maximum in-flight Diego cell instances:** 4% of total instances
- **Maximum in-flight Diego cell instances overridable:** Yes

## Best practices

Set the `max_in_flight` variable low enough that the remaining component instances are not overloaded by typical use. If component instances are overloaded during updates, upgrades, or typical use, users might experience downtime.

Some more precise guidelines include:

- Increase the count of Diego Cells before an upgrade, and then set `max_in_flight` to the number of Diego Cells that you added. For example, if you have 200 Diego Cells, adding 20 Diego Cells and then setting `max_in_flight` to 20 activates the Diego Cells to be upgraded in 10 batches of 20 Diego Cells each. The default settings might require 25 batches of 8 Diego Cells each. If each batch takes 10 minutes, using this process might save you over 2.5 hours of upgrade time. Ensure that you scale the number of Diego Cells down after the upgrade.
- Quorum-based components are components with odd-numbered settings in the manifest. For quorum-based components such as etcd, set `max_in_flight` to 1. This preserves quorum and prevents a split-brain scenario from occurring as jobs restart. For more information about split-brain scenarios, see [Split-brain \(computing\)](#) on Wikipedia.
- For other components, set `max_in_flight` to the number of instances that you can afford to have down at any one time. The best values for your deployment vary based on your capacity planning. In a highly redundant deployment, you can set the number to a higher value to allow updates to run faster. However, if your components are at high utilization, you can keep the number low to prevent downtime.

- Setting `max_in_flight` to a value greater than or equal to the number of instances you have running can reduce capability.

## Verify your internal MySQL cluster is healthy

If your TAS for VMs uses an internal MySQL database cluster, run the mysql-diag tool to validate your cluster is healthy before you proceed with any TAS upgrade. An unhealthy cluster can trigger other TAS components to fail during an upgrade.

To run mysql-diag, follow the instructions in [Running mysql-diag](#).

If your cluster appears unhealthy, follow instructions in [Recovering from MySQL cluster downtime](#) to restore your cluster to a healthy state before upgrading TAS.

## Set a maximum number of starting containers

You can use the Diego Auctioneer job to configure the maximum number of app instances starting at a given time. This prevents Diego from scheduling too much new work for your platform to handle concurrently. A lower default can prevent server overload during cold start, which can be important if your infrastructure is not sized for a large number of concurrent cold starts.

The Diego Auctioneer only schedules a fixed number of app instances to start concurrently. This limit applies to both single and multiple Diego Cells. For example, if you set the limit to five starting instances, it does not matter if you have one Diego Cell with ten instances or five Diego Cells with two instances each. The auctioneer does not allow more than five instances to start at the same time.

If you are using a cloud-based IaaS, rather than a smaller on-premises solution, VMware recommends setting a larger default. By default, the maximum number of started instances is 200.

To configure the maximum number of started instances in the **Settings** tab of the TAS for VMs tile:

1. Log in to Tanzu Operations Manager.
2. Click the TAS for VMs tile.
3. Select **App Containers**.
4. In the **Max-in-flight container starts** field, enter the maximum number of started instances.
5. Click **Save**.

## Configure file storage

There are critical factors to consider when you evaluate the type of file storage to use in your TAS for VMs deployment. The TAS for VMs blobstore relies on the file storage system to read and write resources, app packages, and droplets.

For more information, see [Blobstore](#) in *Cloud Controller*.

During an upgrade, file storage with insufficient IOPS numbers can negatively impact the performance and stability of your TAS for VMs deployment.

If disk processing time is longer than the evacuation timeout for Diego Cells, then Diego Cells and app instances can take too long to start up, resulting in a cascading failure.

However, the minimum required IOPS depends upon a number of deployment-specific factors and configuration choices. Use this section as a guide when deciding on the file storage configuration for your deployment.

## Select internal or external file storage

When you deploy TAS for VMs, you can select internal file storage or external file storage, either network-accessible or IaaS-provided, as an option in the TAS for VMs tile.

Selecting internal storage causes TAS for VMs to deploy a dedicated VM that uses either NFS or WebDAV for file storage. Selecting external storage allows you to configure file storage provided in network-accessible location or by an IaaS, such as Amazon S3, Google Cloud Storage, or Azure Storage.

Whenever possible, VMware recommends using external file storage.

## Calculate disk load requirements

As a best-effort calculation, estimate the total number of bits needed to move during a system upgrade to determine the IOPS performance required of your file storage.

- **Number of Diego Cells:** As a first calculation, determine the number of Diego Cells that your deployment currently uses. To view the number of Diego Cell instances currently running in your deployment, see the **Resource Config** pane of the TAS for VMs tile. If you expect to scale up the number of instances, use the anticipated scaled number.  
If your deployment uses more than 20 Diego Cells, avoid using internal file storage. Instead, always select external or IaaS-provided file storage.
- **Maximum In-Flight Load and Container Starts for Diego Cells:** Operators can limit the number of containers and Diego Cell instances that Diego starts concurrently. If operators impose no limits, your file storage might experience exceptionally heavy load during an upgrade.

## What happens during TAS for VMs upgrades

During a TAS for VMs upgrade, BOSH drains all Diego Cell VMs that host app instances. BOSH manages this process by upgrading Diego cells in user-configurable batches.

When BOSH triggers an upgrade, each upgrading Diego Cell enters evacuation mode. In evacuation mode, Diego schedules replacements for app instances running on the cell prior to the cell shutting down.

For more information, see [Guidance for Diego Cells](#) in *Configuring TAS for VMs for Upgrades*.

## The cf push command can become unavailable

The `cf push` command is typically available for the duration of a TAS for VMs upgrade. However, `cf push` and other management actions can become unavailable if there is only a single API VM or during BOSH Backup and Restore (BBR).

For more information, see [cf push availability during TAS for VMs upgrades](#).

## TAS for VMs components upgrade

This section describes the order in which VMware Tanzu Operations Manager upgrades components and runs tasks (errands) during a full platform upgrade. It also explains how the scale of different TAS for VMs components affects uptime during upgrades and which components are scalable.

When performing an upgrade, Tanzu Operations Manager first upgrades individual components and then runs one-time tasks.

- [Components](#) describes how Tanzu Operations Manager upgrades TAS for VMs components and explains how individual component upgrades affect broader TAS for VMs capabilities.
- [One-Time Tasks \(Errands\)](#) lists the tasks that Tanzu Operations Manager can run after it upgrades the TAS for VMs components.

## Components

Tanzu Operations Manager upgrades TAS for VMs components in a fixed order that accounts for component dependencies, minimizes downtime, and conforms to other system limitations during the upgrade process.

The type and duration of downtime and other limitations that you can expect during a TAS for VMs upgrade are affected by:

- Component instance scaling. For more information, see [How single-component scaling affects upgrades](#).
- Component upgrade order. For more information, see [Component upgrade order and behavior](#).

### How single-component scaling affects upgrades

In Tanzu Operations Manager, the **Resource Config** pane of the TAS for VMs tile shows the components that the BOSH Director installs:

- **Scalable** component fields let you select the instance count from a range of settings or enter a custom value.
- **Unscalable** component fields allow a maximum of one instance.

When a component is scaled at a single instance, it can experience downtime and other limitations while the single VM restarts. This behavior might be acceptable for a test environment. To avoid downtime in a production environment, you must scale any scalable components, such as Gorouter and Diego Cells, to more than one instance.

For more information about how the scale of each component affects upgrade behavior, see [Component upgrade order and behavior](#).

A full Tanzu Operations Manager upgrade can take multiple hours for large environments. If Tanzu Operations Manager is not properly scaled, you may have limited ability to push an app during that time.

### Component upgrade order and behavior

The following table lists components in the order that Tanzu Operations Manager upgrades each. It also lists which components are scalable and explains how component downtime affects TAS for VMs app and control availability. The table includes these columns:

- **Scalable:** Indicates whether the component is scalable above a single instance.

For components marked with a checkmark in this column, VMware recommends that you change the preconfigured instance value of [1](#) to a value that best supports your production environment. For more information about scaling a deployment, see [High Availability in TAS for VMs](#).

- **Extended Downtime:** Indicates that if there is only one instance of the component, some system capabilities may be unavailable for several minutes or longer during an upgrade.
- **Downtime Affects...:** Indicates the plane of the TAS for VMs platform that component downtime affects, if the component is scaled at single instance:
  - **Apps:** Downtime can affect app availability.
  - **Platform:** Apps remain available during component downtime, but you may not be able to run Cloud Foundry command-line interface (cf CLI) commands, for instance to push, stage, and restart apps.
- **Other Limitations and Information:** Provides:
  - Component availability, behavior, and usage during an upgrade
  - Guidance on disabling the component before an upgrade

Component	Scalable	Extended downtime	Downtime affects...		Other limitations and information
			Apps	Platform	
NATS	✓		✓	✓	If not HA: Change to app routes may be delayed, including making some apps temporarily unrouteable.
Cloud Controller Local Blobstore (if enabled)		✓		✓	Some operations like pushing, staging, and restarting applications will fail. For this reason, it is recommended to use an external blobstore for production environments.
MySQL Proxy	✓	✓		✓	If not HA: Access to the MySQL Server might be temporarily unavailable, resulting in downtime for platform service using MySQL, such as Cloud Controller and UAA.
MySQL Server	✓	✓		✓	If not HA: Platform services using MySQL, such as Cloud Controller and UAA, become temporarily unavailable.
Backup Restore node					
Diego BBS	✓	✓		✓	
UAA	✓	✓		✓	If not HA: Downtime for logging in via the UI or CLI, unless the user already has an active authorization token.
Cloud Controller	✓	✓		✓	
Cloud Controller Worker	✓	✓			
Diego Brain	✓	✓		✓	

Component	Scalable	Extended downtime	Downtime affects...		Other limitations and information
			Apps	Platform	
Gorouter	✓	✓	✓	✓	If not HA: Apps and system components like Cloud Controller will temporarily not receive HTTP requests.
TCP Router (if enabled)	✓	✓	✓		If not HA: Apps and services will temporarily not receive TCP requests.
<b>MySQL Monitor</b>					
Diego Cell	✓	✓	✓	✓	If not HA: Downtime for all apps, including system applications like Apps Manager.
Loggregator Traffic controller	✓			✓	If not HA: Gaps in app logs and app and system component metrics, for multiple minutes.
Log Cache	✓			✓	If not HA: Gaps in app logs and app and system component metrics, for multiple minutes.
Clock Global	✓				
Doppler Server	✓			✓	If not HA: Gaps in app logs and app and system component metrics, for multiple minutes.
CredHub	✓	✓	✓	✓	If not HA: App downtime for apps that use secure credentials. Platform downtime for cf CLI commands such as <code>bind-service</code> and <code>unbind-service</code> for services storing credentials in CredHub.

## One-time tasks (Errands)

After Tanzu Operations Manager upgrades components, it can perform system checks and deploy TAS for VMs components as Cloud Foundry system apps. These tasks can be run in this order:

1. Smoke Test Errand - Run smoke tests against core TAS for VMs systems
2. Usage Service Errand - Push Usage Service system app
3. Offline Docs Errand - Push Offline Documentation system app
4. Apps Manager Errand - Push Apps Manager system app
5. Notifications Errand - Push Notifications server system app
6. Notifications UI Errand - Push Notifications UI system app
7. App Autoscaler Errand - Push App Autoscaler system apps
8. App Autoscaler Smoke Test Errand - Run smoke tests against App Autoscaler
9. Metric Registrar Smoke Test Errand - Run smoke tests against Metric Registrar
10. NFS Broker Errand - Push NFS Broker system app
11. SMB Broker Errand - Push SMB Broker system app
12. Rotate CC Database Key - Rotate the encryption key for the Cloud Controller database

## cf push availability during TAS for VMs upgrades

Availability of `cf push` during TAS for VMs upgrades varies from release to release. Considerations that can affect `cf push` availability include Cloud Controller database (CCDB) migrations and the number of VMs in use. However, `cf push` is generally available for the duration of an upgrade.

## Impact on single VMs vs. high-availability infrastructure

Having a single VM in use, such as a WebDAV, a Gorouter, a UAA, or a Cloud Controller, affects whether `cf push` is available during an upgrade.

If you have scaled out your app to achieve high availability and are not using WebDAV, `cf push` is available for the entire duration of the upgrade. However, upgrades to certain versions of TAS for VMs sometimes require a CCDB schema or data migration, which might cause `cf push` to be unavailable while Cloud Controllers are rolling during the upgrade.

## Availability during a BBR backup

The Cloud Controller API is taken down during the `pre-backup-lock` stage of a BBR backup and put back up again during the `post-backup-unlock` stage. As a result, the `cf push` command becomes unavailable during that time. However, the backup that takes place between those stages is very short, generally only a few minutes. The bulk of the BBR backup operation happens after the `post-backup-unlock` stage, so the Cloud Controller API and `cf push` are available for most of the duration of a BBR backup.

The Uptimer tool can help you measure the availability of the `cf push` command during an upgrade.

For more information, see the [Uptimer repository](#) on GitHub.

## Upgrading from Small Footprint to full TAS for VMs

If you have installed Small Footprint VMware Tanzu Application Service for VMs, you can upgrade your installation to full TAS for VMs. The upgrade process preserves most of the existing tile configuration and transforms the existing Small Footprint TAS for VMs into full TAS for VMs.



### Note

This feature is only available in TAS for VMs v6.0.1 and later.

For more information about choosing between Small Footprint and full TAS for VMs, see [When should you use Small Footprint TAS for VMs?](#) in *Installing TAS for VMs*.

## Preserving data after the upgrade

TAS for VMs stores data in two separate locations: a database and a blobstore. By default, full TAS for VMs uses internal disks, created and maintained by the BOSH Director, for both datastores. Operators can instead provide their own external database and blobstore, if desired.

When you upgrade a Small Footprint TAS for VMs tile to a full TAS for VMs tile:

- Any **internal disks** containing application data are not automatically transferred over. These disks are *orphaned*, unattached to any TAS for VMs instance and no longer actively read or written to by

your deployment. To restore the data, you must reattach any orphaned Small Footprint TAS for VMs disks to the full TAS for VMs deployment, using one of the two procedures described below.

- **External datastores** do not have disks managed by BOSH, and therefore are not orphaned. When the upgrade is complete, these datastores are automatically attached to the new full TAS for VMs deployment, and the stored data is immediately available. You do not need to perform any further steps for external datastores.

It is critical to be aware of which datastores are internal and which are external before beginning the process to upgrade from Small Footprint to full TAS for VMs.



### Caution

Disks become orphaned after you perform the **Apply Changes** to upgrade to full TAS for VMs. After a period of time (by default, five days), BOSH automatically and permanently deletes orphaned disks. Failure to reattach any orphaned Small Footprint TAS disks will result in loss of your data. For more information about orphaned disks, see the [BOSH documentation](#).

## Requirements and prerequisites

In order to upgrade from Small Footprint TAS for VMs, you must:

- **Upgrade to the same major and minor as your Small Footprint TAS for VMs deployment, but a higher patch version.** For example, if your Small Footprint TAS for VMs deployment is at version v6.0.1, you can upgrade to full TAS for VMs v6.0.2, but not to v6.1.0. This prevents potentially severe and unforeseen upgrading issues, due to changes in the topology of TAS for VMs between major or minor versions.



### Note

You cannot upgrade to the same patch version as your Small Footprint TAS for VMs deployment. This is due to a limitation of VMware Tanzu Operations Manager (Tanzu Operations Manager).

- **Finalize all configuration and ensure that no other processes are running on your Small Footprint TAS for VMs deployment.**

For example, there must not be any of these:

- Changes being applied by Tanzu Operations Manager
- Pending changes for any tile, including TAS for VMs
- Actively running operator-initiated BOSH tasks against the deployment

During the upgrade process:

- You must not modify any choices regarding use of internal or external databases and blobstores.
- The underlying IaaS infrastructure for the deployment must not be modified or moved.

- **Back up your deployment using BOSH Backup and Restore.**

If using the [Assisted upgrade](#) approach, you will need:

- The bosh CLI tool, used for interacting with your BOSH deployment. For more information, see the [Cloud Foundry BOSH documentation](#).
- The om CLI tool, used for interacting with Tanzu Operations Manager. For more information, see the [Tanzu Operations Manager documentation](#).

## Upgrade to full TAS for VMs

You can upgrade Small Footprint TAS for VMs to full TAS for VMs either manually, or with the assistance of the Bash scripts provided by VMware. When planning your upgrade schedule, keep in mind that both procedures cause several hours of downtime and involve at least one **Apply Changes** step, as well as stopping and restarting the entire BOSH deployment.



### Caution

During the upgrade process, ensure that all aspects of the deployment and control plane remain constant except when directed otherwise. Making any changes not described in the upgrade procedures can result in unforeseen and potentially unrecoverable data loss or deployment issues.

## Manual upgrade

To upgrade from Small Footprint TAS for VMs to full TAS for VMs manually:

1. Verify that your foundation is in the correct state.
  1. If using an internal database and/or blobstore, scale each down to exactly one (1) instance.  
To count the database and/or blobstore instances:
    - If using Ops Manager, open the **Resource Config** pane of the Small Footprint TAS for VMs tile settings. The database is labeled `Database`. The blobstore is labeled `File Storage`.
    - If using the BOSH CLI tool, run the `bosh instances` command. The database is called `database`. The blobstore is called `blobstore`.
 If necessary, scale down either or both instance groups to 1 in Ops Manager and then run **Apply Changes**.
2. In the **Advanced Features** pane of the Small Footprint TAS for VMs tile settings, check the **Enable upgrade from Small Footprint Tanzu Application Service to VMware Tanzu Application Service for VMs** checkbox.
2. Upgrade the tile.
  1. Select the version of full TAS for VMs to which you wish to upgrade Small Footprint TAS for VMs. This version must be the same major and minor as the existing Small Footprint TAS for VMs installation, and must be a higher patch version than your existing Small

Footprint TAS for VMs installation. Download the full TAS for VMs release from Broadcom Support.

2. Upload the full TAS for VMs release to your foundation and stage it.
3. If your deployment uses an internal database and / or blobstore:
  1. Open the **Resource Config** pane of the full TAS for VMs tile settings.
  2. Scale down both of the following instance groups to 1:
    - MySQL Server
    - NFS Store
  4. Review the staged configuration changes.
  5. Click **Apply Changes**.

If the foundation uses both an external database and an external blobstore, the upgrade procedure is now complete. If not, continue to the next step.

3. Reattach the Small Footprint TAS for VMs disks to the full TAS for VMs deployment.



#### Note

The following instructions assume both an internal database and an internal blobstore. If your foundation uses an external database or an external blobstore, ignore instructions for that specific datastore.

1. Locate the two Small Footprint TAS for VMs disk CIDs that contain your application data.

In a terminal window, run the following command:

```
bosh disks --orphaned
```

For the database disk CID:

- **Instance** begins with `database/`.
- **Orphaned At** is the most recent of all `database/...` rows.
- **Deployment** is the ID of your deployment.

For the blobstore disk CID:

- **Instance** begins with `blobstore/`.
- **Orphaned At** is the most recent of all `blobstore/...` rows.
- **Deployment** is the ID of your deployment.

Record the instance for each of the disks.

2. Locate the two full TAS for VMs instance IDs to which the Small Footprint TAS for VMs disks will be reattached.

In a terminal window, run the following command:

```
bosh -d [DEPLOYMENT] instances -i
```

Where `[DEPLOYMENT]` is the ID of your deployment.

Find the two instance IDs:

- For the database instance ID, `Instance` begins with `mysql/`.
- For the blobstore instance ID, `Instance` begins with `nfs_store/`.

Record the entire value of both instance IDs.

3. Stop the entire BOSH deployment.

Run the following command:

```
bosh -d [DEPLOYMENT] stop
```

Where `[DEPLOYMENT]` is the ID of your deployment.

4. Delete the database and blobstore VMs.

- Run the following command to delete the database VM:

```
bosh -d [DEPLOYMENT] stop --hard mysql
```

Where `[DEPLOYMENT]` is the ID of your deployment.

- Run the following command to delete the blobstore VM:

```
bosh -d [DEPLOYMENT] stop --hard nfs_store
```

Where `[DEPLOYMENT]` is the ID of your deployment.

5. Reattach the orphaned Small Footprint TAS for VMs disks to the correct full TAS for VMs instances.

- Run the following command to reattach the database disk:

```
bosh -d [DEPLOYMENT] attach-disk [FULL_TAS_DATABASE_ID] [SF_TAS_DATABASE_CID]
```

Where:

- `[DEPLOYMENT]` is the ID of your deployment.
- `[FULL_TAS_DATABASE_ID]` is the ID of the full TAS for VMs instance to which the database disk will be attached.
- `[SF_TAS_DATABASE_CID]` is the CID of the orphaned Small Footprint TAS for VMs database disk.
- Run the following command to reattach the blobstore disk:

```
bosh -d [DEPLOYMENT] attach-disk [FULL_TAS_BLOBSTORE_ID] [SF_TAS_BLOBSTORE_CID]
```

Where:

- `[DEPLOYMENT]` is the ID of your deployment.

- `[FULL_TAS_BLOBSTORE_ID]` is the ID of the full TAS for VMs instance to which the blobstore disk will be attached.
  - `[SF_TAS_BLOBSTORE_CID]` is the CID of the orphaned Small Footprint TAS for VMs blobstore disk.
4. Verify that the correct disks were reattached to the database and blobstore instances.

Run the following command:

```
bosh instances -i
```

5. Restart the BOSH deployment.

Run the following command:

```
bosh -d [DEPLOYMENT] start
```

Where `[DEPLOYMENT]` is the ID of your deployment.

After the deployment has restarted, the upgrade from Small Footprint TAS for VMs to full TAS for VMs is complete.

After upgrading to full TAS for VMs, verify that your applications are functioning as expected. If you encounter any issues, contact [Support](#).

A full TAS for VMs deployment can be configured to provide high availability (HA) for applications. For information about HA options and best practices, see [High Availability in TAS for VMs](#).

## Assisted upgrade

VMware provides a set of Bash scripts to assist in the upgrade process. To download these scripts, see [Automation scripts for upgrading Small Footprint TAS for VMs 6.0 to “full” TAS for VMs 6.0](#).

The downloaded archive contains:

- Two automation scripts.
  - The `validate_sf_tas_deployment` script runs against a Small Footprint TAS for VMs deployment and does not alter the deployment in any way. The script scans the deployment configuration to determine if all requirements for the upgrade process are met, and prints out any missing requirements for you to correct. When the script executes successfully, the deployment is ready to be upgraded to full TAS for VMs.
  - The `reattach_sf_tas_disks` script runs against a full TAS for VMs deployment after the deployment has been upgraded from Small Footprint TAS for VMs. The script scans the deployment to ensure that the database and blobstore have at most one instance, and if so, automatically stops all VMs, reattaches the Small Footprint TAS disks, and restarts the deployment. You can run the script multiple times if necessary. It creates log files to determine which instances already have disks reattached, and skips those instances in future executions. When the script executes successfully, the upgrade from Small Footprint TAS for VMs to full TAS for VMs is complete.
- Common helper code.
- A directory in which to store logs.



## Important

Do not modify the directory structure or contents. If you do, the scripts may not work correctly.

To upgrade from Small Footprint TAS for VMs to full TAS for VMs using the automation scripts:

1. Verify that your foundation is in the correct state.

In a terminal window, run the `validate_sf_tas_deployment` script to determine whether all requirements have been met for the upgrade to full TAS for VMs.

- If the script discovers any missing requirements, correct them. For information about how to correct any missing requirements, see [Manual upgrade](#).
- When the script succeeds, the deployment is ready to be upgraded to full TAS for VMs.

2. Upgrade the tile.

1. Select the version of full TAS for VMs to which you wish to upgrade Small Footprint TAS for VMs. This version must be the same major and minor as the existing Small Footprint TAS for VMs installation, and must be a higher patch version than your existing Small Footprint TAS for VMs installation. Download the full TAS for VMs release from Broadcom Support.
2. Upload the full TAS for VMs release to your foundation and stage it.
3. If your deployment uses an internal database and / or blobstore:
  1. Open the **Resource Config** pane of the full TAS for VMs tile settings.
  2. Scale down both of the following instance groups to 1:
    - MySQL Server
    - NFS Store
  4. Review the staged configuration changes.
  5. Click **Apply Changes**.

If the foundation uses both an external database and an external blobstore, the upgrade procedure is now complete. If not, continue to the next step.

3. Reattach the Small Footprint TAS for VMs disks to the full TAS for VMs deployment.

In a terminal window, run the `reattach_sf_tas_disks` script against the newly upgraded full TAS for VMs deployment to automatically reattach the Small Footprint TAS for VMs disks that contain your applications' data.

- If the script exits early with errors, examine the script logs, correct the errors, and rerun the script. You can also contact [Support](#) for assistance.
- When the script succeeds, the upgrade from Small Footprint TAS for VMs to full TAS for VMs is complete.

# Administering TAS for VMs

In this section:

- **Managing the runtime**
  - Configuring file storage for TAS for VMs
  - Configuring load balancing for TAS for VMs
  - Configuring SSL termination for TAS for VMs on vSphere
  - Identifying the API endpoint for your TAS for VMs instance
  - Creating and modifying Quota Plans
  - Stopping and starting virtual machines
  - Scaling TAS for VMs
  - Scaling Cloud Controller
  - Cloud Controller Multi-Process Mode
  - Configuring Diego Cell disk cleanup scheduling
  - Examining GrootFS disk usage
  - Using metadata
  - Custom-branding Apps Manager
  - Planning TAS for VMs orgs and spaces
  - Orgs, spaces, roles, and permissions
  - CPU entitlement in TAS for VMs
- **Enabling developers**
  - Using Docker in TAS for VMs
  - Using Docker registries
  - Enabling volume services
  - Managing service brokers
  - Managing access to service plans
  - Dashboard Single Sign-on
  - Using feature flags
  - Managing custom buildpacks
  - Supporting WebSockets

- **Managing internal MySQL**
  - Monitoring the health of your MySQL via the MySQL Proxy
  - Scaling your internal MySQL
  - Running mysql-diag
  - Recovering from MySQL cluster downtime
- **User accounts and communications**
  - TAS for VMs user types
  - Creating and managing users with the cf CLI
  - Creating and managing users with the UAA CLI (UAAC)
  - Creating new TAS for VMs user accounts
  - Configuring UAA password policy
  - Adding existing SAML or LDAP users to TAS for VMs
  - Configuring app security groups for email notifications
  - Getting started with the notifications service
  - **UAA**
    - User Account and Authentication server
    - User Accounts and Authentication concepts
    - Identity providers in UAA
    - UAA performance metrics
  - **Configuring authentication and enterprise SSO for TAS for VMs**
    - Configuring authentication and enterprise SSO for TAS for VMs
    - Configuring CA as an identity provider
    - Configuring PingFederate as an identity provider
- **Traffic and security**
  - **Front end**
    - Securing incoming traffic
    - Configuring SSH access for TAS for VMs
    - App SSH components and processes
    - Configuring front end idle timeout for Gorouter and HAProxy
  - **Load balancing and routing**
    - Using your own ILoad balancer
    - Enabling and configuring TCP routing
    - Enabling IPv6 for hosted apps
    - Supporting HTTP/2
    - Configuring proxy settings for all apps

- Switching app domains
- TLS connections in TAS for VMs
- Configuring Load balancer Health Checks for TAS for VMs Routers
- Configuring route service lookup
- **Internal app security**
  - Container security
  - Container-to-container networking
  - App security groups
  - Restricting app access to internal TAS for VMs components
- **Certificates and credentials**
  - Rotating runtime CredHub encryption keys
  - Rotating the Cloud Controller database encryption key
  - Securing service instance credentials with Runtime CredHub
  - Providing a certificate for your TLS termination point
  - Trusted system certificates
  - CredHub
    - CredHub credential types
    - Backing up and restoring CredHub instances
    - Using hardware security modules with CredHub
    - Using a key management service with CredHub
    - Setting up and deploying CredHub with BOSH
    - Troubleshooting CredHub
- **Component Communications**
  - BOSH DNS network communications
  - Cloud Controller network communications
  - Container-to-container network communications
  - CredHub network communications
  - Diego network communications
  - Loggregator network communications
  - MySQL network communications
  - NATS network communications
  - Routing network communications
  - UAA network communications
- **Managing apps and their stacks**
  - Using the Stack Auditor plug-in

- Changing stacks
- Restaging your apps on a Windows stack

## Managing the Runtime

In this section:

- Configuring file storage for TAS for VMs
- Configuring load balancing for TAS for VMs
- Configuring SSL termination for TAS for VMs on vSphere
- Identifying the API endpoint for your TAS for VMs instance
- Creating and modifying Quota Plans
- Stopping and starting virtual machines
- Scaling TAS for VMs
- Scaling Cloud Controller
- Cloud Controller Multi-Process Mode
- Configuring Diego Cell disk cleanup scheduling
- Examining GrootFS disk usage
- Using metadata
- Custom-branding Apps Manager
- Planning TAS for VMs orgs and spaces
- Orgs, spaces, roles, and permissions
- CPU entitlement in TAS for VMs

## Configuring file storage for TAS for VMs

Here are instructions for configuring file storage for VMware Tanzu Application Service for VMs (TAS for VMs) based on your IaaS and installation method. See the section that applies to your use case.

To minimize system downtime, VMware recommends using highly resilient and redundant *external* filestores for your TAS for VMs file storage. For more factors to consider when selecting file storage, see [Configure File Storage](#) in [Configuring TAS for VMs for Upgrades](#).



### Important

After initial installation, do not change file storage configuration without first migrating existing files to the new provider.



### Important

Multiple TAS for VMs foundations should not point at the same blobstore buckets. Doing so will result in data loss. See [Automatic blob cleanup]([..../concepts/architecture/cloud-](#)

controller.html#automatic-clean) for more information.

## Internal file storage

Internal file storage is only appropriate for small, non-production deployments.

To use the TAS for VMs internal filestore:

1. Select **Internal WebDAV**.
2. Click **Save**.

## AWS

This section describes how to configure file storage for AWS.

If you followed the procedure in [Preparing to Deploy Tanzu Operations Manager on AWS](#), you created the necessary resources for external S3-compatible file storage.



### Important

Some blobstores, for example, Oracle Cloud Infrastructure Object Storage, do not support S3 Signature v4 Streaming. To use blobstores without S3 Signature v4 Streaming support with VMware Tanzu Application Service for VMs, deselect the Signature v4 streaming check box.

For more information, see [AWS-S3 Signature v4 Streaming](#).

For production-level Operations Manager deployments on AWS, VMware recommends selecting **External S3-compatible filestore**.

For instructions, see [External S3-Compatible Filestore](#).

You can also configure Fog blobstores to use AWS IAM instance profiles. For instructions, see [Fog with AWS IAM Instance Profiles](#).

For more information about production level Operations Manager deployments on AWS, see [AWS Reference Architecture](#).

## External S3-Compatible filestore

To use an external S3-compatible filestore for TAS for VMs file storage:

1. Select **External S3-compatible filestore**.
2. For **URL endpoint**, enter the `https://` URL endpoint for your region. For example, `https://s3.us-west-2.amazonaws.com/`.
3. For **Access key**, enter the access key of the `pcf-user` you created when you configured AWS for Operations Manager.
4. For **Secret key**, enter the secret key of the `pcf-user` you created when configuring AWS for Operations Manager.

5. (Optional) If your TAS for VMs deployment is on AWS, you can alternatively enter the **Access key** and **Secret key** of the `pcf-user` you created when you configured AWS for Operations Manager. If you select the **S3 AWS with instance profile** check box and also enter an **Access key** and **Secret key**, the instance profile overrules the access key and secret key.
6. From the **S3 signature version** drop-down menu, select **V4 signature**. For more information about S3 signatures, see the [AWS documentation](#).
7. For **Region**, enter the AWS region in which your S3 buckets are located. For example, `us-west-2`.
8. To encrypt the contents of your S3 filestore, select the **Allow server-side encryption** check box. This option is only available for AWS S3.
9. (Optional) If you selected the **Allow server-side encryption** check box, you can also configure a KMS key in **KMS key ID**. TAS for VMs uses this KMS key to encrypt files uploaded to the blobstore. If you do not provide a KMS Key ID, TAS for VMs uses the default AWS key. For more information, see the [AWS documentation](#).
10. Deselect the **Path-style S3 URLs (deprecated)** check box. When this check box is deselected, the S3 bucket is accessed using the virtual-hosted model instead of the path-based model. The deprecated path-based model is removed from AWS as of September 30, 2020. For more information about S3 path deprecation, see the [AWS News Blog](#).
11. Enter names for your S3 buckets:

Tanzu Operations Manager Field	Value	Description
Buildpacks bucket name	<code>pcf-buildpacks-bucket</code>	This S3 bucket stores app buildpacks.
Droplets bucket name	<code>pcf-droplets-bucket</code>	This S3 bucket stores app droplets. VMware recommends that you use a unique bucket name for droplets, but you can also use the same name as above.
Packages bucket name	<code>pcf-packages-bucket</code>	This S3 bucket stores app packages. VMware recommends that you use a unique bucket name for packages, but you can also use the same name as above.
Resources bucket name	<code>pcf-resources-bucket</code>	This S3 bucket stores app resources. VMware recommends that you use a unique bucket name for app resources, but you can also use the same name as above.

12. Configure these check boxes depending on whether your S3 buckets are versioned:
  - For versioned S3 buckets, select the **Use versioning for backup and restore** check box to archive each bucket to a version.  
If you are using Dell ECS, VMware recommends against versioned buckets. For more information, see the [Dell EMC ECS documentation](#). You can use mirroring as an alternative to versioning.
  - For unversioned S3 buckets:
    1. Deselect the **Use versioning for backup and restore** check box.

2. For **Backup buildpacks bucket name**, **Backup droplets bucket name**, and **Backup packages bucket name**, enter a backup bucket name for each active bucket. The backup bucket name must be different from the name of the active bucket it backs up. For more information about creating external S3 blobstores, see the [Cloud Foundry documentation](#).
13. For **Backup region**, enter the name of the AWS region in which your backup S3 buckets are located. For example, `us-west-2`. These are the buckets used to back up and restore the contents of your S3 filestore.
14. (Optional) Enter names for your backup S3 buckets:

Tanzu Operations Manager Field	Value	Description
<b>Backup buildpacks bucket name</b>	<code>buildpacks-backup-bucket</code>	This S3 bucket is used to back up and restore your buildpacks bucket. This bucket name must be different from the buckets you named above.
<b>Backup droplets bucket name</b>	<code>droplets-backup-bucket</code>	This S3 bucket is used to back up and restore your droplets bucket. VMware recommends that you use a unique bucket name for droplet backups, but you can also use the same name as above.
<b>Backup packages bucket name</b>	<code>packages-backup-bucket</code>	This S3 bucket is used to back up and restore your packages bucket. VMware recommends that you use a unique bucket name for package backups, but you can also use the same name as above.

15. Click **Save**.



For more information about AWS S3 signatures, see the [AWS documentation](#).

## Fog with AWS IAM instance profiles

To configure Fog blobstores to use AWS IAM instance profiles:

1. Configure an additional `cloud-controller` IAM role with the following policy to give access to the S3 buckets you plan to use:

```
{
  "Version": "2012-10-21",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [ "s3:*" ],
      "Resource": [
        "arn:aws:s3:::YOUR-AWS-BUILDPACK-BUCKET",
        "arn:aws:s3:::YOUR-AWS-BUILDPACK-BUCKET/*",
        "arn:aws:s3:::YOUR-AWS-DROPLET-BUCKET",
        "arn:aws:s3:::YOUR-AWS-DROPLET-BUCKET/*",
        "arn:aws:s3:::YOUR-AWS-PACKAGE-BUCKET",
        "arn:aws:s3:::YOUR-AWS-PACKAGE-BUCKET/*",
        "arn:aws:s3:::YOUR-AWS-RESOURCE-BUCKET",
        "arn:aws:s3:::YOUR-AWS-RESOURCE-BUCKET/*"
      ]
    }
  ]
}
```

```

        "arn:aws:s3:::YOUR-AWS-BUILDPACK-BUCKET/*",
    ]
}
}

```

Replace `YOUR-AWS-BUILDPACK-BUCKET`, `YOUR-AWS-DROPLET-BUCKET`, `YOUR-AWS-PACKAGE-BUCKET`, and `YOUR-AWS-RESOURCE-BUCKET` with the names of your AWS buckets. Do not use periods (.) in your AWS bucket names.

If you use the AWS console, an IAM role is automatically assigned to an IAM instance profile with the same name, `cloud-controller`. If you do not use the AWS console, you must create an IAM instance profile with a single assigned IAM role. For more information, see [Step 4: Create an IAM Instance Profile for Your Amazon EC2 Instances](#) in the AWS documentation.

2. In your [BOSH cloud config](#), create a [VM extension](#) to add the IAM instance profile you created to VMs using the extension.

```

vm_extensions:
- cloud_properties:
    iam_instance_profile: cloud-controller
    name: cloud-controller-iam

```

You can also create a VM extension using the Tanzu Operations Manager API. For more information, see [Create or Update a VM Extension](#) in *Managing Custom VM Extensions*.

3. In your TAS for VMs deployment manifest, use the `cloud-controller-iam` VM extension you created for the instance groups containing `cloud_controller`, `cloud_controller_worker`, and `cloud_controller_clock`, as in the following example:

```

instance_groups:
...
- name: api
  ...
  vm_extensions:
  - cloud-controller-iam
...
- name: cc-worker
  ...
  vm_extensions:
  - cloud-controller-iam
...
- name: scheduler
  ...
  vm_extensions:
  - cloud-controller-iam

```

4. Insert the following configuration into your deployment manifest under `properties.cc`:

```

cc:
  buildpacks:
    blobstore_type: fog
    buildpack_directory_key: YOUR-AWS-BUILDPACK-BUCKET
    fog_connection: &fog_connection
      provider: AWS
      region: us-east-1
    use_iam_profile: true

```

```

droplets:
  blobstore_type: fog
  droplet_directory_key: YOUR-AWS-DROPLET-BUCKET
  fog_connection: *fog_connection
packages:
  blobstore_type: fog
  app_package_directory_key: YOUR-AWS-PACKAGE-BUCKET
  fog_connection: *fog_connection
resource_pool:
  blobstore_type: fog
  resource_directory_key: YOUR-AWS-RESOURCE-BUCKET
  fog_connection: *fog_connection

```

Replace `YOUR-AWS-BUILDPACK-BUCKET`, `YOUR-AWS-DROPLET-BUCKET`, `YOUR-AWS-PACKAGE-BUCKET`, and `YOUR-AWS-RESOURCE-BUCKET` with the names of your AWS buckets. Do not use periods (.) in your AWS bucket names.

5. (Optional) Provide other configuration with the `fog_connection` hash, which is passed through to the Fog gem.

## GCP

This section describes how to configure file storage for GCP.

For production-level Operations Manager deployments on GCP, VMware recommends selecting **External Google Cloud Storage**. For more information about production-level Operations Manager deployments on GCP, see [GCP Reference Architecture](#).

TAS for VMs can use Google Cloud Storage (GCS) as its external filestore by using either a GCP interoperable storage access key or your GCS service account.

To configure file storage for GCP, follow one of these procedures:

- Use an access key and secret key. For more information, see [External Google Cloud Storage with access key and secret key](#) below.
- Use a service account. For more information, see [External Google Cloud Storage with service account](#) below.

### External Google Cloud Storage with access key and secret key

To configure file storage for GCP using an access key and secret key:

1. Select **External GCS with access key and secret key**.
2. Enter values for **Access key** and **Secret key**. To obtain the values for these fields:
  1. In the GCP Console, go to the **Storage** tab.
  2. Click **Settings**.
  3. Click **Interoperability**.
  4. If necessary, click **Enable interoperability access**. If interoperability access is already configured, confirm that the default project matches the project where you are installing TAS for VMs.
  5. Click **Create a new key**.

6. Copy and paste the generated values into the corresponding TAS for VMs fields. TAS for VMs uses these values for authentication when connecting to GCS.
3. Enter the names of the storage buckets you created in [Step 6: Create Database Instance and Databases](#) in *Preparing to Deploy Tanzu Operations Manager on GCP Manually*:
  - o **Buildpacks bucket name:** `PREFIX-PCF-buildpacks`
  - o **Droplets bucket name:** `PREFIX-PCF-droplets`
  - o **Packages bucket name:** `PREFIX-PCF-packages`
  - o **Resources bucket name:** `PREFIX-PCF-resources`

Where `PREFIX` is a prefix of your choice, required to make the bucket name unique.

4. Click **Save**.

#### External Google Cloud Storage with service account

To configure file storage for GCP using a service account:



You can use the same service account that you created for Tanzu Operations Manager, or you can create a separate service account for TAS for VMs file storage. To create a separate service account for TAS for VMs file storage, follow the procedure in [Step 1: Set Up IAM Service Accounts](#) in *Preparing to deploy Tanzu Operations Manager on GCP manually*, but only select the **Storage > Storage Admin** role.

1. Select **External GCS with service account**.
2. For **GCP project ID**, enter the Project ID on your GCP Console that you want to use for your TAS for VMs file storage.
3. For **GCP service account email**, enter the email address associated with your GCP account.
4. For **GCP service account key**, enter in JSON format the account key that you use to access the specified GCP project.
5. Enter the names of the storage buckets you created in [Step 7: Create storage buckets](#) in *Preparing to Deploy Tanzu Operations Manager on GCP Manually*:
  - o **Buildpacks bucket name:** `PREFIX-PCF-buildpacks`
  - o **Droplets bucket name:** `PREFIX-PCF-droplets`
  - o **Packages bucket name:** `PREFIX-PCF-packages`
  - o **Resources bucket name:** `PREFIX-PCF-resources`
  - o **Backup bucket name:** `PREFIX-PCF-backup`
- Where `PREFIX` is a prefix of your choice, required to make the bucket name unique.
6. Click **Save**.

## Azure

This section describes how to configure file storage for Azure.

For production-level Operations Manager deployments on Azure, VMware recommends selecting **External Azure Storage**. For more information about production-level Operations Manager deployments on Azure, see [Azure Reference Architecture](#).

For more factors to consider when selecting file storage, see [Configure File Storage](#) in *Configuring TAS for VMs for Upgrades*.

To use external Azure file storage for your TAS for VMs filestore:

1. Select **External Azure storage**.
2. To create a new storage account for the TAS for VMs filestore:
  1. Go to the Azure Portal.
  2. Click the **Storage accounts** tab.
  3. Click the + icon to add a new storage account.
  4. In the **Name** field, enter a unique name for the storage account. This name must be all lowercase and contain 3 to 24 alphanumeric characters.
  5. For **Deployment model**, select **Resource manager**.
  6. From the **Account kind** drop-down menu, select **General purpose**.
  7. For **Performance**, select **Standard**.
  8. From the **Replication** drop-down menu, select **Locally-redundant storage (LRS)**.
  9. For **Storage service encryption**, select **Disabled**.
  10. From the **Subscription** drop-down menu, select the subscription where you want to deploy TAS for VMs resources.
  11. For **Resource group**:
  12. Select **Use existing**.
  13. Enter the name of the resource group where you deployed TAS for VMs.
  14. From the **Location** drop-down menu, select the location where you are deploying TAS for VMs.
  15. Click **Create**.
3. To create new storage containers in the storage account you created in the previous step:
  1. In the Azure Portal, select the new storage account from the dashboard.
  2. Under **Blob Service**, select **Containers** to create one or more containers in this storage account for buildpacks, droplets, resources, and packages.
  3. Select **Soft Delete**.
  4. Select **Enabled** to configure soft delete in your Azure storage account.



BBR requires that you configure soft delete in your Azure storage account before you configure backup and restore for your Azure blobstores in Tanzu Operations Manager. You must set a reasonable retention policy to

minimize storage costs. For more information about configuring soft delete in your Azure storage account, see the [Azure documentation](#).

5. For each container that you create, set the **Access type** to **Private**.
4. In TAS for VMs, enter the name of the storage account you created for **Account name**.
5. In the **Access key** field, enter one of the access keys provided for the storage account. To obtain a value for this field:
  1. Go to the Azure Portal.
  2. Click the **Storage accounts** tab.
  3. Click **Access keys**.
6. For **Environment**, enter the name of the Azure Cloud environment that contains your storage. This value defaults to AzureCloud, but other options include AzureChinaCloud, AzureUSGovernment, and AzureGermanCloud.
7. For **Buildpacks container name**, enter the container name for storing your app buildpacks.
8. For **Droplets container name**, enter the container name for your app droplet storage. VMware recommends that you use a unique container name, but you can use the same container name as the previous step.
9. For **Packages container name**, enter the container name for packages. VMware recommends that you use a unique container name, but you can use the same container name as the previous step.
10. For **Resources container name**, enter the container name for resources. VMware recommends that you use a unique container name, but you can use the same container name as the previous step.
11. (Optional) To allow backup and restore for your Azure blobstores in TAS for VMs, select the **Allow backup and restore** check box.



You must configure all listed storage containers to use soft deletes.

12. (Optional) To configure TAS for VMs to restore your containers to a different Azure storage account than the account where you take backups:
  1. For **Restore storage account**, enter the name of the Azure storage account from which you want to restore your containers. If you want to restore to the same storage account where you take backups, do not configure this field.
  2. For **Restore access key**, enter the access key for the Azure storage account you specified in **Restore storage account**. If you want to restore to the same storage account where you take backups, do not configure this field.
13. Click **Save**.



To configure backup and restore for a TAS for VMs installation that uses an S3-compatible blobstore, see [Enabling external blobstore backups](#).

# OpenStack

For production-level Operations Manager deployments on OpenStack, VMware recommends selecting **External S3-compatible filestore**. For more information about production-level Operations Manager deployments on OpenStack, see [OpenStack Reference Architecture](#).

For more factors to consider when selecting file storage, see [Configure File Storage](#) in *Configuring TAS for VMs for Upgrades*.

To use an external S3-compatible filestore for TAS for VMs file storage:

1. Select **External S3-compatible filestore**.
2. For **URL endpoint**, enter the `https://` URL endpoint for your region. For example, `https://s3.us-west-2.amazonaws.com/`.
3. For **Access key**, enter the access key of the `pcf-user` you created when you configured AWS for Operations Manager.
4. For **Secret key**, enter the secret key of the `pcf-user` you created when configuring AWS for Operations Manager.
5. From the **S3 signature version** drop-down menu, select **V4 signature**. For more information about S3 signatures, see the [AWS documentation](#).
6. For **Region**, enter the AWS region in which your S3 buckets are located. For example, `us-west-2`.
7. To encrypt the contents of your S3 filestore, select the **Allow server-side encryption** check box. This option is only available for AWS S3.
8. (Optional) If you selected the **Allow server-side encryption** check box, you can also configure a KMS key in **KMS key ID**. TAS for VMs uses this KMS key to encrypt files uploaded to the blobstore. If you do not provide a KMS Key ID, TAS for VMs uses the default AWS key. For more information, see the [AWS documentation](#).
9. Deselect the **Path-style S3 URLs (deprecated)** check box. When this check box is deselected, the S3 bucket is accessed using the virtual-hosted model instead of the path-based model. The deprecated path-based model is removed from AWS as of September 30, 2020. For more information about S3 path deprecation, see the [AWS News Blog](#).
10. Enter names for your S3 buckets:

Tanzu Operations Manager Field	Value	Description
Buildpacks bucket name	<code>pcf-buildpacks-bucket</code>	This S3 bucket stores app buildpacks.
Droplets bucket name	<code>pcf-droplets-bucket</code>	This S3 bucket stores app droplets. VMware recommends that you use a unique bucket name for droplets, but you can also use the same name as above.
Packages bucket name	<code>pcf-packages-bucket</code>	This S3 bucket stores app packages. VMware recommends that you use a unique bucket name for packages, but you can also use the same name as above.

Tanzu Operations Manager Field	Value	Description
Resources bucket name	pcf-resources-bucket	This S3 bucket stores app resources. VMware recommends that you use a unique bucket name for app resources, but you can also use the same name as above.

11. Configure these check boxes depending on whether your S3 buckets are versioned:
  - For versioned S3 buckets, select the **Use versioning for backup and restore** check box to archive each bucket to a version.  
If you are using Dell ECS, VMware recommends against versioned buckets. For more information, see the [Dell EMC ECS documentation](#). You can use mirroring as an alternative to versioning.
  - For unversioned S3 buckets:
    1. Deselect the **Use versioning for backup and restore** check box.
    2. For **Backup buildpacks bucket name**, **Backup droplets bucket name**, and **Backup packages bucket name**, enter a backup bucket name for each active bucket. The backup bucket name must be different from the name of the active bucket it backs up. For more information about creating external S3 blobstores, see the [Cloud Foundry documentation](#).
12. For **Backup region**, enter the name of the AWS region in which your backup S3 buckets are located. For example, `us-west-2`. These are the buckets used to back up and restore the contents of your S3 filestore.
13. (Optional) Enter names for your backup S3 buckets:

Tanzu Operations Manager Field	Value	Description
Backup buildpacks bucket name	<code>buildpacks-backup-bucket</code>	This S3 bucket is used to back up and restore your buildpacks bucket. This bucket name must be different from the buckets you named above.
Backup droplets bucket name	<code>droplets-backup-bucket</code>	This S3 bucket is used to back up and restore your droplets bucket. VMware recommends that you use a unique bucket name for droplet backups, but you can also use the same name as above.
Backup packages bucket name	<code>packages-backup-bucket</code>	This S3 bucket is used to back up and restore your packages bucket. VMware recommends that you use a unique bucket name for package backups, but you can also use the same name as above.

14. Click **Save**.



For more information about AWS S3 signatures, see the [AWS documentation](#).

# vSphere

For production-level Operations Manager deployments on vSphere, VMware recommends selecting **External S3-compatible filestore** and using an external filestore. For more information about production-level Operations Manager deployments on vSphere, see [vSphere Reference Architecture](#).

For more factors to consider when selecting file storage, see [Configure File Storage](#) in *Configuring TAS for VMs for Upgrades*.

To use an external S3-compatible filestore for TAS for VMs file storage:

1. Select **External S3-compatible filestore**.
2. For **URL endpoint**, enter the `https://` URL endpoint for your region. For example, `https://s3.us-west-2.amazonaws.com/`.
3. For **Access key**, enter the access key of the `pcf-user` you created when you configured AWS for Operations Manager.
4. For **Secret key**, enter the secret key of the `pcf-user` you created when configuring AWS for Operations Manager.
5. From the **S3 signature version** drop-down menu, select **V4 signature**. For more information about S3 signatures, see the [AWS documentation](#).
6. For **Region**, enter the AWS region in which your S3 buckets are located. For example, `us-west-2`.
7. To encrypt the contents of your S3 filestore, select the **Allow server-side encryption** check box. This option is only available for AWS S3.
8. (Optional) If you selected the **Allow server-side encryption** check box, you can also configure a KMS key in **KMS key ID**. TAS for VMs uses this KMS key to encrypt files uploaded to the blobstore. If you do not provide a KMS Key ID, TAS for VMs uses the default AWS key. For more information, see the [AWS documentation](#).
9. Deselect the **Path-style S3 URLs (deprecated)** check box. When this check box is deselected, the S3 bucket is accessed using the virtual-hosted model instead of the path-based model. The deprecated path-based model is removed from AWS as of September 30, 2020. For more information about S3 path deprecation, see the [AWS News Blog](#).
10. Enter names for your S3 buckets:

Tanzu Operations Manager Field	Value	Description
Buildpacks bucket name	<code>pcf-buildpacks-bucket</code>	This S3 bucket stores app buildpacks.
Droplets bucket name	<code>pcf-droplets-bucket</code>	This S3 bucket stores app droplets. VMware recommends that you use a unique bucket name for droplets, but you can also use the same name as above.
Packages bucket name	<code>pcf-packages-bucket</code>	This S3 bucket stores app packages. VMware recommends that you use a unique bucket name for packages, but you can also use the same name as above.

Tanzu Operations Manager Field	Value	Description
Resources bucket name	pcf-resources-bucket	This S3 bucket stores app resources. VMware recommends that you use a unique bucket name for app resources, but you can also use the same name as above.

11. Configure these check boxes depending on whether your S3 buckets are versioned:
  - For versioned S3 buckets, select the **Use versioning for backup and restore** check box to archive each bucket to a version.  
If you are using Dell ECS, VMware recommends against versioned buckets. For more information, see the [Dell EMC ECS documentation](#). You can use mirroring as an alternative to versioning.
  - For unversioned S3 buckets:
    1. Deselect the **Use versioning for backup and restore** check box.
    2. For **Backup buildpacks bucket name**, **Backup droplets bucket name**, and **Backup packages bucket name**, enter a backup bucket name for each active bucket. The backup bucket name must be different from the name of the active bucket it backs up. For more information about creating external S3 blobstores, see the [Cloud Foundry documentation](#).
12. For **Backup region**, enter the name of the AWS region in which your backup S3 buckets are located. For example, `us-west-2`. These are the buckets used to back up and restore the contents of your S3 filestore.
13. (Optional) Enter names for your backup S3 buckets:

Tanzu Operations Manager Field	Value	Description
Backup buildpacks bucket name	<code>buildpacks-backup-bucket</code>	This S3 bucket is used to back up and restore your buildpacks bucket. This bucket name must be different from the buckets you named above.
Backup droplets bucket name	<code>droplets-backup-bucket</code>	This S3 bucket is used to back up and restore your droplets bucket. VMware recommends that you use a unique bucket name for droplet backups, but you can also use the same name as above.
Backup packages bucket name	<code>packages-backup-bucket</code>	This S3 bucket is used to back up and restore your packages bucket. VMware recommends that you use a unique bucket name for package backups, but you can also use the same name as above.

14. Click **Save**.



For more information about AWS S3 signatures, see the [AWS documentation](#).

# Configuring load balancing for TAS for VMs

You can configure load balancing for VMware Tanzu Application Service for VMs (TAS for VMs) by entering the names of your Load Balancers in the **Resource Config** pane of the TAS for VMs tile. This procedure varies by your IaaS and how you prepared (“paved”) it for installing TAS for VMs.

See the following section that corresponds to your use case.

## AWS

### AWS with Terraform

To set up load balancing for TAS for VMs on AWS using Terraform:

1. Create a file named `vm_extensions_config.yml` with the following content, depending on which release you are using:

- **VMware Tanzu Application Service for VMs (TAS for VMs):**

```
---
product-name: cf
resource-config:
  diego_brain:
    elb_names:
      - alb:SSH_TARGET_GROUP_1
      - alb:SSH_TARGET_GROUP_2
    additional_vm_extensions:
      - ssh-lb-security-groups
  router:
    elb_names:
      - alb:WEB_TARGET_GROUPS_1
      - alb:WEB_TARGET_GROUPS_2
    additional_vm_extensions:
      - web-lb-security-groups
  tcp_router:
    elb_names:
      - alb:TCP_TARGET_GROUP_1
      - alb:TCP_TARGET_GROUP_2
    additional_vm_extensions:
      - tcp-lb-security-groups
```

- **Small Footprint TAS for VMs:**

```
---
product-name: cf
resource-config:
  control:
    elb_names:
      - alb:SSH_TARGET_GROUP_1
      - alb:SSH_TARGET_GROUP_2
    additional_vm_extensions:
      - ssh-lb-security-groups
  router:
    elb_names:
      - alb:WEB_TARGET_GROUPS_1
      - alb:WEB_TARGET_GROUPS_2
```

```

additional_vm_extensions:
- web-lb-security-groups
tcp_router:
  elb_names:
  - alb:TCP_TARGET_GROUP_1
  - alb:TCP_TARGET_GROUP_2
additional_vm_extensions:
- tcp-lb-security-groups

```

2. Replace values in the file as follows:

- **SSH\_TARGET\_GROUP\_X**: Enter your SSH target groups. You can find these values by running:

```
terraform output ssh_target_groups
```

- **WEB\_TARGET\_GROUPS\_X**: Enter your web target groups. You can find these values by running:

```
terraform output web_target_groups
```

- **TCP\_TARGET\_GROUP\_X**: Enter your TCP target groups. You can find these values by running:

```
terraform output tcp_target_groups
```

3. Apply the VM extension configuration using the `om` CLI. For more information about `om`, see the [Om](#) repository on GitHub.

```

om -k \
-t "OPS-MANAGER-FQDN" \
-u "USERNAME" \
-p "PASSWORD" \
configure-product \
-c vm_extensions_config.yml

```

Where:

- **OPS-MANAGER-FQDN** is the URL at which you access your VMware Tanzu Operations Manager instance. This corresponds to `ops_manager_dns` in the Terraform output.
- **USERNAME** is the user name you entered when configuring internal authentication.
- **PASSWORD** is the password you entered when configuring internal authentication.



#### Note

If you did not configure internal authentication, you must edit this command to use a client ID and secret instead of user name and password. For more information, see [Authentication](#) in the Om repository on GitHub.

## AWS paved manually

To configure the Gorouter to use AWS Elastic Load Balancers:

1. Record the names of your ELBs. If you followed the procedures in [Preparing to deploy Tanzu Operations Manager on AWS](#), you created:
  2. `-ssh-elb`: An SSH load balancer. This is a Classic Load Balancer.
  3. `-tcp-elb`: A TCP load balancer. This is a Classic Load Balancer.
  4. `-web-elb`: A web load balancer. This is an Application Load Balancer.
    - `-web-elb-target-group`: A target group for the web load balancer.
5. In the TAS for VMs tile, select **Resource Config**.
6. Enter the name of your SSH load balancer.
7. Show the **Load Balancers** field underneath the job that handles SSH requests. This depends on the TAS for VMs release you are using:
  - **TAS for VMs**: Click the icon next to the **Diego Brain** job name to expand the row.
  - **Small Footprint TAS for VMs**: Click the icon next to the **Control** job name to expand the row.
8. In the **Load Balancers** field, enter the name of your SSH load balancer: `-ssh-elb`.
9. Click to expand the **Router** row, and fill in the **Load Balancers** field with a value determined by the type of load balancer you are using:
10. **Application Load Balancer**: Enter a comma-separated list of the names of the target group of your web load balancer, prefixed with `alb:: alb:-web-elb-target-group`. The prefix indicates to Tanzu Operations Manager that you entered the name of a target group. The prefix is required for AWS Application Load Balancers and Network Load Balancers.
11. **Classic Load Balancer**: Enter the name of the load balancer: `-web-elb`.
12. If you activated TCP routing, expand the **TCP Router** row and enter the name of your TCP load balancer: `-tcp-elb`.

## Azure

### Azure with Terraform

To configure the Gorouter to use Azure Load Balancers:

1. Select **Resource Config**.
2. Ensure a `Standard` VM type is selected for the **Router** VM. The TAS for VMs deployment fails if you select a `Basic` VM type.
3. Click the icon next to the **Router** job name to expand the row, showing a **Load Balancers** field and **INTERNET CONNECTED** check box underneath.
4. Enter the value of `web_lb_name` from your Terraform output in the **Resource Config** pane under **Load Balancers** for the **Router** job.
5. Expand the row for the job that handles SSH requests. This depends on the TAS for VMs release you are using:

- **TAS for VMs:** Click the icon next to **Diego Brain**.
  - **Small Footprint TAS for VMs:** Click the icon next to **Control**.
6. For the SSH load balancer, enter the value of `diego_ssh_lb_name` from your Terraform output.
  7. Ensure that the **INTERNET CONNECTED** check boxes are deselected for all jobs.
  8. Scale the number of instances as appropriate for your deployment.



#### Note

For a high availability deployment of Tanzu Operations Manager on Azure, VMware recommends scaling the number of each TAS for VMs job to a minimum of three instances. Using three or more instances for each job creates a sufficient number of availability sets and fault domains for your deployment. For more information, see [Azure reference architecture](#)

## Azure paved manually

To configure the Gorouter to use Azure Load Balancers:

1. Select **Resource Config**.
2. Ensure a **Standard** VM type is selected for the **Router** VM. The TAS for VMs deployment fails if you select a **Basic** VM type.
3. Retrieve the name(s) of your external Azure Load Balancer (ALB) by navigating to the Azure portal, clicking **All resources**, and locating your **Load balancer** resource.  
The Azure portal sometimes displays the names of resources with incorrect capitalization. Always use the Azure CLI to retrieve the correctly capitalized name of a resource. To see the list of resources, run `az network lb list`.
4. In the **Resource Config** pane of the TAS for VMs tile, click the icon next to the **Router** job name to expand the row, showing a **Load Balancers** field and **INTERNET CONNECTED** check box underneath.
5. Enter the name of your external ALB in the field under **Load Balancers**. If you have multiple external ALBs this field accepts a comma separated list.
6. Retrieve the name of your Diego SSH Load Balancer by navigating to the Azure portal, clicking **All resources**, and locating your **Load balancer** resource.
7. In the **Resource Config** pane of the TAS for VMs tile, expand the row for the job that handles SSH requests. This depends on the TAS for VMs release you are using:
  - **TAS for VMs:** Click the icon next to **Diego Brain**.
  - **Small Footprint TAS for VMs:** Click the icon next to **Control**.
8. Enter the name of the Diego SSH Load Balancer in the field under **Load Balancers**.
9. Ensure that the **INTERNET CONNECTED** check boxes are deselected for all jobs.
10. Scale the number of instances as appropriate for your deployment.

**Note**

For a high availability deployment of Tanzu Operations Manager on Azure, VMware recommends scaling the number of each TAS for VMs job to a minimum of three instances. Using three or more instances for each job creates a sufficient number of availability sets and fault domains for your deployment. For more information, see [Azure reference architecture](#).

## GCP with Terraform

To configure the Gorouter to use GCP Load Balancers:

1. Select **Resource Config**.
2. Click the icon next to the **Router** job name to expand the row, showing a **Load Balancers** field and **INTERNET CONNECTED** check box underneath.
3. In the **Load Balancers** field, enter a comma-separated list consisting of the values of `ws_router_pool` and `http_lb_backend_name` from your Terraform output. For example, `tcp:-cf-ws,http:-httpslb`. These are the names of the TCP WebSockets and HTTP(S) Load Balancers for your deployment.  
Do not add a space between key and value pairs in the **LOAD BALANCER** field, or it fails.
4. If you activated TCP routing in the **Networking** pane of the TAS for VMs tile, add the value of `tcp_router_pool` from your Terraform output, prepended with `tcp:`, to the **Load Balancers** column of the **TCP Router** row. For example, `tcp:-cf-tcp`.
5. Expand the row for the job that handles SSH requests. This depends on the TAS for VMs release you are using:
  - o **TAS for VMs**: Click the icon next to **Diego Brain**.
  - o **Small Footprint TAS for VMs**: Click the icon next to **Control**.
6. Under **Load Balancers** for the SSH job, enter the value of `ssh_router_pool` from your Terraform output, prepended with `tcp::`. For example, `tcp:PCF-ssh-proxy`.
7. Verify that the **Internet Connected** check box for every job is activated. The Terraform templates do not provision a Network Address Translation (NAT) box for Internet connectivity to your VMs, so they are provided with ephemeral public IP addresses to allow the jobs to reach the Internet. If you want to provision a Network Address Translation (NAT) box to provide Internet connectivity to your VMs instead of providing them with public IP addresses, deactivate the **Internet Connected** check boxes. For more information about using NAT in GCP, see [VPC network overview](#) in the GCP documentation.
8. Click **Save**.

## GCP paved manually

To configure the Gorouter to use GCP Load Balancers:

1. Go to the GCP Console and select **Load balancing**.

The screenshot shows the 'Load balancing' section of the TAS for VMs interface. On the left is a sidebar with icons for various service types. The main area lists three load balancers:

- pcf-router**: Protocol HTTP(S), status green, edit icon.
- pcf-ssh**: Protocol TCP, status green, edit icon.
- pcf-websockets**: Protocol TCP, status green, edit icon.

A note at the bottom of the list says: "To edit load balancing resources like forwarding rules and target proxies, go to the [advanced menu](#)".

You can see the SSH load balancer, the HTTP(S) load balancer, the TCP WebSockets load balancer, and the TCP router that you created in [Preparing to Deploy Tanzu Operations Manager on GCP](#).

2. Record the name of your SSH load balancer and your TCP WebSockets load balancer, `PCF-wss-logs` and `PCF-ssh-proxy`.
3. Click your HTTP(S) load balancer, `PCF-global-`.

The screenshot shows the configuration for the **pcf-router** load balancer. It includes:

- Frontend**: IP:Port 130.211.46.155:80, Certificate -.
- Host and path rules**: All unmatched (default) maps to All unmatched (default) via pcf-backend.
- Backend**: Backend services include **1. pcf-backend**. The table shows:
 

Instance group	Zone	Healthy	Autoscaling	Balancing mode	Capacity
your-instance-group	us-central1-a	0/0	Off	Max CPU: 80%	100%

4. Under **Backend services**, record the name of the back end service of the HTTP(S) load balancer, `PCF-http-lb-backend`.
5. In the TAS for VMs tile, select **Resource Config**.
6. Click the icon next to the **Router** job name to expand the row, showing a **Load Balancers** field and **INTERNET CONNECTED** check box underneath.
7. In the **Load Balancers** field, enter a comma separated list consisting of the name of your TCP WebSockets load balancer and the name of your HTTP(S) load balancer back end with the protocol prepended. For example, `tcp:PCF-wss-logs,http:PCF-http-lb-backend`.



### Important

Do not add a space between key and value pairs in the `LOAD BALANCER` field, or it fails.

8. If you activated TCP routing in the **Networking** pane of the TAS for VMs tile and set up the TCP load balancer in GCP, add the name of your TCP load balancer, prepended with `tcp:`, to the **Load Balancers** column of the **TCP Router** row. For example, `tcp:-tcp-router`.
  9. Expand the row for the job that handles SSH requests. This depends on the TAS for VMs release you are using:
    - **TAS for VMs**: Click the icon next to **Diego Brain**.
    - **Small Footprint TAS for VMs**: Click the icon next to **Control**.
  10. Under **Load Balancers** for the SSH job, enter the value of `ssh_router_pool` from your Terraform output, prepended with `tcp::`. For example, `tcp:PCF-ssh-proxy`.
  11. Verify that the **Internet Connected** check box for every job is deactivated.
- When preparing your GCP environment, you provisioned a Network Address Translation (NAT) box to provide Internet connectivity to your VMs instead of providing them with public IP addresses to allow the jobs to reach the Internet.
- If you want to provision a Network Address Translation (NAT) box to provide internet connectivity to your VMs instead of providing them with public IP addresses, deactivate the **Internet Connected** check boxes. For more information about using NAT in GCP, see [VPC network overview](#) in the GCP documentation.
12. Click **Save**.

## vSphere with NSX-T or NSX-V

In the **Resource Config** pane of the TAS for VMs tile, you configure vSphere NSX-T or NSX-V load balancing and security group membership for TAS for VMs jobs.

To configure load balancing and security group membership for TAS for VMs jobs:

1. Select **Resource Config**.
2. For each TAS for VMs job that you want to load-balance, click the down arrow to reveal its configuration fields. The external-facing job instance groups in TAS for VMs are:
  3. **Diego Brain** in TAS for VMs, or **Control** in Small Footprint TAS for VMs, for SSH traffic
  4. **Router** for web traffic
  5. **TCP Router** for TCP traffic
  6. Enter a load balancer configuration for each job:
  7. **NSX-T**:
    1. In the vSphere NSX Manager > **Advanced Networks & Security > Groups** pane, define an NSGroup to include VMs running each load-balanced job, such as `pas-ssh-group`, `pas-tcp-group`, and `pas-web-group`.
    2. In the **NS Groups** field in **Resource Config**, enter a comma-separated list of the NSGroups you defined.
    3. In the **Logical Load Balancer**: Enter a JSON-formatted structure defining a list of `server_pools` as pairs of `name` and `port` definitions.

## 8. NSX-V:

1. **Security Groups:** Enter a comma separated list of Security Groups defined in NSX-V to include each load-balanced job, such as `pas-ssh-group`, `pas-tcp-group`, and `pas-web-group`.
  2. **Edge Load Balancers:** Enter a JSON-formatted structure listing edge Load Balancers, each defined by `edge_name`, `pool_name`, `security_group`, `port`, and `monitor_port` definitions.
9. Click **Save**.

## Configuring SSL termination for Tanzu Operations Manager on vSphere

To use SSL termination in Operations Manager, you must configure your own load balancer.

Production environments must use a highly-available customer-provided load balancing solution that:

- Provides SSL termination with wildcard DNS location
- Provides load balancing to each of the TAS for VMs Gorouter IPs
- Adds appropriate `x-forwarded-for` and `x-forwarded-proto` HTTP headers

To use your own load balancer:

1. Register one or more static IP address for Operations Manager with your load balancer.
2. Create an A record in your DNS that points to your load balancer IP address. The A record associates the **System domain** and **Apps domain** that you configure in the **Domains** pane of the TAS for VMs tile with the IP address of your load balancer.

For example, with `.example.com` as the main subdomain for your Operations Manager installation and a load balancer IP address `198.51.100.1`, you must create an A record in your DNS that serves `example.com` and points `*` to `198.51.100.1`.

Name	Type	Data	Domain
<code>*.tas</code>	A	<code>198.51.100.1</code>	<code>example.com</code>

3. Go to the Tanzu Operations Manager Installation Dashboard.
4. Click the TAS for VMs tile.
5. Select **Networking**.
6. In the **Gorouter IPs** field, enter the static IP address for Operations Manager that you have registered with your load balancer. Enter multiple IP addresses as a comma-separated list or as a range.
7. Provide your SSL certificate in the **Certificates and private keys for the Gorouter** fields. For more information, see [Providing a Certificate for your TLS Termination Point](#).

When adding or removing TAS for VMs Gorouters, you must update your load balancing solution configuration with the appropriate IP addresses.

## Identifying the API endpoint for your TAS for VMs instance

The API endpoint for your VMware Tanzu Application Service for VMs (TAS for VMs) deployment. The target URL is the API endpoint of the deployment's Cloud Controller. Find your Cloud Controller API endpoint by consulting your cloud operator, from the Apps Manager, or from the command line.

### From the Apps Manager

Log in to the Apps Manager for your TAS for VMs instance, then click **Tools** in the navigation panel. The **Getting Started** section of the Tools page shows your API endpoint.

```
GETTING STARTED
```

```
$ cf help
$ cf login -a https://api.your_endpoint.com
API endpoint: https://api.your_endpoint.com
Username> your_username
Password> your_password
Org> your_org
Space> your_space
$ cf push your_app
```

### From the command line

From a command line, use the `cf api` command to view your API endpoint.

Example:

```
$ cf api
API endpoint: https://api.example.com (API version: 2.2.0)
```

## Creating and modifying quota plans in TAS for VMs

You can use quota plans in TAS for VMs, including creating and modifying quota plans for orgs and spaces.

### Quota plans overview

Quota plans are named sets of memory, service, log rate, and instance usage quotas. For example, one quota plan might allow up to 10 services, 10 routes, 2 GB of RAM, and 2 KB of generated logs, while another might offer 100 services, 100 routes, 10 GB of RAM, and 16 KB of generated logs. Quota plans have user-friendly names, but are referenced in VMware Tanzu Application Service for VMs (TAS for VMs) internal systems by unique GUIDs.

Quota plans are not directly associated with user accounts. Instead, every org has a list of available quota plans, and the account admin assigns a specific quota plan from the list to the org. Everyone in the org shares the quotas described by the plan. There is no limit to the number of defined quota plans an account can have, but only one plan can be assigned at a time.

You must set a quota plan for an org, but you can choose whether to set a space quota. For more information, see the [Orgs and Spaces](#) sections of the *Orgs, Spaces, Roles, and Permissions* topic.

For information about managing network policy quotas, see [Manage Network Policy Quotas](#) in *Configuring Container-to-Container Networking*.

## Org quota plan attributes

Name	Description	Valid Values	Example Value
<code>name</code>	The name used to identify the plan	A sequence of letters, digits, and underscore characters. Quota plan names within an account must be unique.	<code>silver_quota</code>
<code>total_memory_in_mb</code>	Total memory allowed for all the started processes and running tasks in an organization	An integer	2048
<code>total_instances</code>	Total instances of all the started processes allowed in an organization.	An integer	25
<code>per_process_memory_in_mb</code>	Maximum memory for a single process or task	An integer	2048
<code>log_rate_limit_in_bytes_per_second</code>	Total log rate limit allowed for all the started processes and running tasks in an organization	An integer	1024
<code>per_app_tasks</code>	Maximum number of running tasks in an organization	An integer	5
<code>paid_services_allowed</code>	Specifies whether instances of paid service plans can be created.	<code>true</code> or <code>false</code>	<code>true</code>
<code>total_service_instances</code>	Total number of service instances allowed in an organization.	An integer	10
<code>total_service_keys</code>	Total number of service keys allowed in an organization.	An integer	20
<code>total_routes</code>	Total number of routes allowed in an organization.	An integer	500
<code>total_reserve_d_ports</code>	Total number of ports that are reservable by routes in an organization.	An integer not greater than <code>routes.total_routes</code>	60
<code>total_domains</code>	Total number of domains that can be scoped to an organization.	An integer	6
<code>organizations</code>	A relationship to the organizations where the quota is applied.	A list of organization guids	9b370018-c38e-44c9-86d6-155c76801104, 12370033-458e-44c2-12d6-789c76801005
<code>trial_db_allowed</code>	This is a legacy field. Value can be <code>true</code> or <code>false</code> ignored.		<code>true</code>

## Default quota plan for an org

TAS for VMs installs with a quota plan named `default` with the following values:

- Memory limit: `10240 MB`
- Total routes: `1000`
- Total services: `100`
- Non-basic aervices allowed: `true`
- Trial DB allowed: `true`
- Log rate limit: `unlimited`

## Creating a quota plan for an org

The org manager sets and manages quotas. For more information, see [Orgs, Spaces, Roles, and Permissions](#).

You must create a quota plan for the org. To create a new quota plan for org, see [Create a Quota Plan for an Org Through the cf CLI](#).

### Creating a quota plan for an org through the cf CLI

To create a new quota plan for an org through the cf CLI:

1. Run:

```
cf create-org-quota QUOTA-NAME -m TOTAL-MEMORY -i INSTANCE-MEMORY -l LOG-RATE-LIMIT -r NUMBER-OF-ROUTES -s NUMBER-OF-SERVICE-INSTANCES
```

Where:

- `QUOTA-NAME` is the name you want to give the quota plan.
- `TOTAL-MEMORY` is the total amount of memory you want to allocate to all app instances in the org.
- `INSTANCE-MEMORY` is the maximum amount of memory an app instance can use. Specify `-1` to allow app instances to use an unlimited amount of memory.
- `LOG-RATE-LIMIT` is the total number of logs per second you want to allow all app instances in the org to send to Loggregator.
- `NUMBER-OF-ROUTES` is the total number of routes you want to allow all app instances in the org.
- `NUMBER-OF-SERVICE-INSTANCES` is the total number of service instances you want to allow all app instances in the org.
- (Optional) Include the `--allow-paid-service-plans` flag to allow the quota plan to provision instances of paid service plans.

For example:

```
cf create-org-quota small -m 2048M -i 1024M -l 2K -r 10 -s 10 --allow-paid-service-plans
```

## Modifying a quota plan for an org

### Modify a quota plan for an org through the cf CLI

To modify an existing quota plan for an org through the cf CLI:

1. View all existing quota plans for your org by running:

```
cf org-quotas
```

This command returns output similar to the following example:

Getting org quotas as admin...

	name	total memory	instance memory	routes	service instances
	paid service plans	app instances	route ports	log volume	per second
default	100G	unlimited	1000	unlimited	
allowed		unlimited	100	unlimited	
free	0	unlimited	1000	0	
disallowed		unlimited	0	4K	
paid	10M	unlimited	1000	unlimited	
allowed		unlimited	0	unlimited	
small	1G	1G	10	10	
allowed		unlimited	0	2K	
trial	2G	1G	1000	0	
disallowed		unlimited	0	1K	

2. Record the name of the quota plan you want to modify.
3. Run:

```
cf update-org-quota QUOTA-NAME -n NEW-QUOTA-NAME -m TOTAL-MEMORY -i INSTANCE-MEMORY -r NUMBER-OF-ROUTES -s NUMBER-OF-SERVICE-INSTANCES
```

Where:

- **QUOTA-NAME** is the name of the quota plan you want to modify.
- (Optional) **NEW-QUOTA-NAME** is the new name you want to give the quota plan.
- (Optional) **TOTAL-MEMORY** is the total amount of memory you want to allocate to all app instances in the org.
- (Optional) **INSTANCE-MEMORY** is the maximum amount of memory an app instance can use. Specify **-1** to allow app instances to use an unlimited amount of memory.
- (Optional) **LOG-RATE-LIMIT** is the total number of logs per second you want to allow all app instances in the org to send to Loggregator.

- (Optional) `NUMBER-OF-ROUTES` is the total number of routes you want to allow all app instances in the org.
- (Optional) `NUMBER-OF-SERVICE-INSTANCES` is the total number of service instances you want to allow all app instances in the org.
- (Optional) To allow the quota plan to provision instances of paid service plans, include the `--allow-paid-service-plans` flag. To prevent the quota plan from provisioning instances of paid service plans, include the `--disallow-paid-service-plans` flag.

For example:

```
cf update-org-quota small -n medium -m 4096M -i 2048M -l 8K -r 20 -s 20 --allow
-paid-service-plans
```

## Assign a quota plan to an org

To assign a quota plan to an org:

1. Run:

```
cf set-org-quota ORG QUOTA-NAME
```

Where:

- `ORG` is the name of the org to which you want to assign the quota plan.
- `QUOTA-NAME` is the name of the quota plan you want to assign to the org.

## Create and modify quota plans for a space

For each org, Org Managers create and modify quota plans for spaces in the org. If an Org Manager allocates a space quota, TAS for VMs verifies that resources do not exceed the allocated space limit. For example, when a Space Developer deploys an app, TAS for VMs first checks the memory allocation at the space level, then at the org level.

To create a quota plan for an individual space within an org, see [Create a Quota Plan for a Space](#).

To modify a quota plan for an individual space within an org, see [Modify a Quota Plan for a Space](#).

## Creating a quota plan for a space

To create a quota plan for an individual space within an org:

1. Run:

```
cf create-space-quota QUOTA-NAME -m TOTAL-MEMORY -i INSTANCE-MEMORY -l LOG-RATE
-LIMIT -r NUMBER-OF-ROUTES -s NUMBER-OF-SERVICE-INSTANCES
```

Where:

- `TOTAL-MEMORY` is the total amount of memory you want to allocate to all app instances in the space.

- **INSTANCE-MEMORY** is the maximum amount of memory an app instance can use. Specify **-1** to allow app instances to use an unlimited amount of memory.
- **LOG-RATE-LIMIT** is the total number of logs per second you want to allow all app instances in the org to send to Loggregator.
- **NUMBER-OF-ROUTES** is the total number of routes you want to allow all app instances in the space.
- **NUMBER-OF-SERVICE-INSTANCES** is the total number of service instances you want to allow all app instances in the space.
- (Optional) Include the **--allow-paid-service-plans** flag to allow the quota plan to provision instances of paid service plans.

For example:

```
cf create-space-quota big -m 4096M -i 1024M -l 16K -r 20 -s 20 --allow-paid-service-plans
```

## Modifying a quota plan for a space

To modify a quota plan for an individual space within an org:

1. View all existing quota plans for all of the spaces in your org by running:

```
cf space-quotas
```

The above command returns output similar to the following example:

```
Getting space quotas for org example-org as admin...
```

name	total memory	instance memory	routes	service instances	p aid service plans	log volume per second
		app instances	route ports			
big	4G	1G	20	20		a
llowed		unlimited	0	16K		
trial	2G	1G	20	20		a
llowed		unlimited	0	2K		

2. Record the name of the quota plan you want to modify.
3. Run:

```
cf update-space-quota QUOTA-NAME -n NEW-QUOTA-NAME -m TOTAL-MEMORY -i INSTANCE-MEMORY -r NUMBER-OF-ROUTES -s NUMBER-OF-SERVICE-INSTANCES
```

Where:

- **QUOTA-NAME** is the name of the quota plan you want to modify.
- (Optional) **NEW-QUOTA-NAME** is the new name you want to give the quota plan.
- (Optional) **TOTAL-MEMORY** is the total amount of memory you want to allocate to all app instances in the space.

- (Optional) `INSTANCE-MEMORY` is the maximum amount of memory an app instance can use. Specify `-1` to allow app instances to use an unlimited amount of memory.
- (Optional) `LOG-RATE-LIMIT` is the total number of logs per second you want to allow all app instances in the org to send to Loggregator.
- (Optional) `NUMBER-OF-ROUTES` is the total number of routes you want to allow all app instances in the space.
- (Optional) `NUMBER-OF-SERVICE-INSTANCES` is the total number of service instances you want to allow all app instances in the space.
- (Optional) To allow the quota plan to provision instances of paid service plans, include the `--allow-paid-service-plans` flag. To prevent the quota plan from provisioning instances of paid service plans, include the `--disallow-paid-service-plans` flag.

For example:

```
cf update-space-quota big -n bigger -m 4096M -i 20 -l 32K -r 20 -s 20 --allow-paid-service-plans
```

## Assign a quota plan to a space

To assign a quota to a space, run the following command. Replace the placeholder attributes with the values for this quota plan:

To assign a quota plan to a space:

1. In a terminal window, run:

```
cf set-space-quota SPACE QUOTA-NAME
```

Where:

- `SPACE` is the name of the space to which you want to assign the quota plan.
- `QUOTA-NAME` is the name of the quota plan you want to assign to the space.



If you attempt to assign a quota plan with a log rate limit to a space containing apps that are already configured to send an unlimited number of logs to Loggregator, the command returns an error. To remedy this issue, see [Configure apps with unlimited Log Rate Limits](#).

## Configure apps with unlimited log rate limits

If you assign a quota plan with a log rate limit to a space containing apps that are already configured to send an unlimited number of logs to Loggregator, you see an error similar to the following example:

```
Setting space quota big to space example-space as admin...
Current usage exceeds new quota values. The space(s) being assigned this quota contain apps running with an unlimited log rate limit.
FAILED
```

Before you can assign a quota plan to the space, you must configure each app in the space with a log rate limit that is lower than the log rate limit specified in the quota plan.

To update the log rate limit for an app in the space to which you want to assign a quota plan:

1. Run:

```
cf scale -l LOG-RATE-LIMIT APP-NAME
```

Where:

- `LOG-RATE-LIMIT` is the log rate limit in bytes per second that you want to configure for the app.
- `APP-NAME` is the name of the app for which you want to configure a log rate limit.

After you have configured a log rate limit for each app in the space, follow the procedure in [Assign a Quota Plan to a Space](#).

## View list of space and org quota commands

To view a list and brief description of all cf CLI commands related to space and org quotas:

1. Run:

```
cf help -a
```

2. In the terminal output, find the following commands:

...	
<b>ORG ADMIN:</b>	
org-quotas	List available organization quotas
org-quota	Show organization quota
set-org-quota	Assign a quota to an organization
create-org-quota	Define a new quota for an organization
delete-org-quota	Delete an organization quota
update-org-quota	Update an existing organization quota
share-private-domain	Share a private domain with a specific org
unshare-private-domain	Unshare a private domain with a specific org
<b>SPACE ADMIN:</b>	
space-quotas	List available space quotas
space-quota	Show space quota info
create-space-quota	Define a new quota for a space

e	update-space-quota	Update an existing space quota
a	delete-space-quota	Delete a space quota
	set-space-quota	Assign a quota to a space
	unset-space-quota	Unassign a quota from a space

## Stopping and starting virtual machines in TAS for VMs

You can stop and start the component TAS for VMs virtual machines that make up your deployment.

This article assumes you are using [BOSH CLI version 2](#).

In some cases, you might want to stop all your VMs (for example, power down your deployment) or start all of your VMware Tanzu Application Service for VMs (TAS for VMs) VMs (for example, recover from a power outage). You can stop or start all TAS for VMs VMs with a single `bosh` command.

If you want to shut down or start up a single VM in your deployment, you can use the manual process described in [Stopping and Starting Individual TAS for VMs VMs](#).

This procedure uses the BOSH Command Line Interface (BOSH CLI). For more information about using this tool, see [Advanced Troubleshooting with the BOSH CLI](#).

## Stopping and starting all TAS for VMs VMs

This section describes how to stop and start all the VMs in your deployment.

### Stopping all TAS for VMs VMs

To shut down all the VMs in your deployment:

1. Scale down the following jobs to one instance:
  - `consul_server`
  - `mysql`
2. Run the following command for each of the deployments listed in the previous step:

```
bosh -e MY-ENV -d MY-DEPLOYMENT stop --hard
```

Where:

- `MY-ENV` is the alias you set for the BOSH Director.
- `MY-DEPLOYMENT` is the name of your deployment.

For example:

```
$ bosh -e prod -d mysql stop --hard
```

This command stops all VMs in the specified deployment. The `--hard` flag instructs BOSH to delete the VMs but retain any persistent disks.

## Starting all TAS for VMs VMs

To start all the VMs in your deployment:

1. Select the product deployment for the VMs you want to shut down. You can run the following command to locate CF deployment manifests:

```
$ find /var/tempest/workspaces/default/deployments -name cf-* .yml
```

2. Run the following command:

```
bosh -e MY-ENV -d MY-DEPLOYMENT start
```

Where:

- `MY-ENV` is the alias you set for the BOSH Director.
- `MY-DEPLOYMENT` is the name of your deployment.

For example:

```
$ bosh -e prod -d mysql start
```

This command starts all VMs in the specified deployment.

3. If you require high availability in your deployment, scale up all instance groups to the original or desired counts.

## Stopping and starting individual TAS for VMs VMs

This section describes how to stop and start individual VMs in your deployment.

### Find the names of your TAS for VMs VMs

You need the full names of the VMs to stop and start them using the BOSH CLI. To find full names for the VMs running each component, run `bosh -e MY-ENV instances`, replacing `MY-ENV` with the alias you set for your BOSH Director. To filter the list of instances by deployment, run `bosh -e MY-ENV -d MY-DEPLOYMENT instances`.

For example:

```
$ bosh -e prod -d mysql instances
...
Deployment 'mysql'

Instance          Process State  AZ   IPs
mysql/0123-abcd-4567ef89  running      -  10.244.0.6
mysql/abcd-0123-ef4567ab    running      -  10.244.0.2

2 instances
...
```

You can see the full name of each VM in the `Instance` column of the terminal output. Each full name has:

- A prefix indicating the component function of the VM.
- An identifier string specific to the VM.

For any component, you can look for its prefix in the `bosh instances` output to find the full name of the VM or VMs that run it.

## Stopping an individual TAS for VMs VM

To stop a job, run the following command for the component in your TAS for VMs deployment, replacing `MY-ENV` with the alias you set for your BOSH Director and `MY-DEPLOYMENT` with the name of the deployment:

```
bosh -e MY-ENV -d MY-DEPLOYMENT stop VM-NAME
```

To delete the instance that contains the job, run the following command for the component in your TAS for VMs deployment:

```
bosh -e MY-ENV -d MY-DEPLOYMENT stop VM-NAME --hard
```

Use the full name of the component VM as listed in your `bosh instances` terminal output without the unique identifier string.

For example, the following command stops the Loggregator Traffic Controller job:

```
$ bosh -e prod -d loggregator stop loggregator_trafficcontroller
```

To stop a specific instance of a job, include the identifier string at the end of its full name.

For example, the following command stops the Loggregator Traffic Controller job on only one Diego Cell instance:

```
$ bosh -e prod -d loggregator stop loggregator_trafficcontroller/0123-abcd-4567ef89
```

To delete the VM, include `--hard` at the end of the command. This command does not delete persistent disks.

For example, the following command deletes a specific Loggregator Traffic Controller instance:

```
$ bosh -e prod -d loggregator stop loggregator_trafficcontroller/0123-abcd-4567ef89 --hard
```

## Starting an individual TAS for VMs VM

Run the following command for the component in your TAS for VMs deployment you wish to start, replacing `MY-ENV` with the alias you set for your BOSH Director and `MY-DEPLOYMENT` with the name of the deployment. Use the full name of the component VM as listed in your `bosh vms` terminal output without the unique identifier string.

```
bosh -e MY-ENV -d MY-DEPLOYMENT start VM-NAME
```

The following example command starts the Loggregator Traffic Controller VM:

```
$ bosh -e prod -d loggregator start loggregator_trafficcontroller
```

To start a specific instance of a VM, include the identifier string at the end of its full name.

For example, the following command starts the Loggregator Traffic Controller job on one Diego Cell instance:

```
$ bosh -e prod -d loggregator start loggregator_trafficcontroller/0123-abcd-4567ef89
```

## Scaling TAS for VMs

You can scale VMware Tanzu Application Service for VMs (TAS for VMs) for different deployment scenarios.

For information about capacity scaling indicators for TAS for VMs, see [Key capacity scaling indicators](#).

TAS for VMs defaults to a highly available resource configuration. For more information, see [High Availability in TAS for VMs](#).

To increase the capacity and availability of the TAS for VMs platform, and to decrease the chances of downtime, you can scale a deployment up using the following instructions.

## Scaling recommendations

The following table provides the instance counts that VMware recommends for a high-availability deployment and the minimum instances for a functional deployment:

VMware Tanzu Application Service for VMs Job	Recommended Instance Number for HA	Minimum Instance Number	Notes
Diego Cell	≥ 3	1	The optimal balance between CPU and memory sizing and instance count depends on the performance characteristics of the apps that run on Diego Cells. Scaling vertically with larger Diego Cells makes for larger points of failure, and more apps go down when a Diego Cell fails. On the other hand, scaling horizontally decreases the speed at which the system re-balances apps. Re-balancing 100 Diego Cells takes longer and demands more processing overhead than re-balancing 20 Diego Cells.
Diego Brain	≥ 2	1	For high availability, use at least one per AZ, or at least two if only one AZ.
Diego BBS	≥ 2	1	For high availability in a multi-AZ deployment, use at least one instance per AZ. Scale Diego BBS to at least two instances for high availability in a single-AZ deployment.

VMware Tanzu Application Service for VMs Job	Recommended Instance Number for HA	Minimum Instance Number	Notes
MySQL Server	3	1	If you use an external database in your deployment, you can set the MySQL Server instance count to <a href="#">0</a> . To scale down an internal MySQL cluster, see <a href="#">Scaling Down Your MySQL Cluster</a> in <a href="#">Scaling Internal MySQL</a> .
MySQL Proxy	2	1	If you use an external database in your deployment, then you can set the MySQL Proxy instance count to <a href="#">0</a> .
NATS	$\geq 2$	1	In a high-availability deployment, you might run a single NATS instance if your deployment lacks the resources to deploy two stable NATS servers. Components using NATS are resilient to message failures and the BOSH Resurrector recovers the NATS VM quickly if it becomes non-responsive.
Cloud Controller	$\geq 2$	1	Scale the Cloud Controller to accommodate the number of requests to the API and the number of apps in the system.
Clock Global	$\geq 2$	1	For a high-availability deployment, scale the Clock Global job to a value greater than 1 or to the number of AZs you have.
Router	$\geq 2$	1	Scale the Gorouter to accommodate the number of incoming requests. Additional instances increase available bandwidth. In general, this load is much less than the load on Diego Cells.
UAA	$\geq 2$	1	
Doppler Server	$\geq 2$	1	Deploying additional Doppler servers splits traffic across them. For a high-availability deployment, VMware recommends at least two per AZ.
Loggregator TrafficController	$\geq 2$	1	Deploying additional Loggregator TrafficController instances allows you to direct traffic to them in a round-robin manner. For a high-availability deployment, VMware recommends at least two per AZ.
Log Cache	$\geq 3$	1	Deploying additional Log Cache instances increases the total storage, sharding data by app ID. If app logs and metrics are sharded to an unavailable instance, they are unavailable when the designated instance is unavailable regardless of the number of instances or AZs. Data is not re-balanced unless you increase or decrease the number of desired instances in Operations Manager and apply changes.
CredHub	$\geq 3$	2	CredHub is a scalable component. For high availability, use at least one instance per AZ, or at least three instances if only one AZ is present.

## Scaling up TAS for VMs

You can determine when to scale up TAS for VMs components by reviewing the capacity scaling indicators. For more information, see [Key Capacity Scaling Indicators](#).

To scale up TAS for VMs instances:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Resource Config**.

Resource Config			
JOB	INSTANCES	PERSISTENT DISK TYPE	VM TYPE
Consul	Automatic: 3	Automatic: 1 GB	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
NATS	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
File Storage	Automatic: 1	Automatic: 100 GB	Automatic: medium.mem (cpu: 1, ram: 6 GB, disk: 8 GB)
MySQL Proxy	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
MySQL Server	Automatic: 3	Automatic: 100 GB	Automatic: large.disk (cpu: 2, ram: 8 GB, disk: 64 GB)
Backup Prepare Node	Automatic: 1	Automatic: 200 GB	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Diego BBS	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
UAA	Automatic: 2	None	Automatic: medium.disk (cpu: 2, ram: 4 GB, disk: 32 GB)
Cloud Controller	Automatic: 2	None	Automatic: medium.disk (cpu: 2, ram: 4 GB, disk: 32 GB)
HAProxy	Automatic: 1	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Router	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
MySQL Monitor	Automatic: 1	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Clock Global	Automatic: 1	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Cloud Controller Worker	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Diego Brain	Automatic: 3	Automatic: 1 GB	Automatic: small (cpu: 1, ram: 2 GB, disk: 8 GB)
Diego Cell	Automatic: 3	None	Automatic: xlarge.disk (cpu: 4, ram: 16 GB, disk: 128 GB)
Loggregator Trafficcontroller	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Syslog Adapter	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Syslog Scheduler	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Doppler Server	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
TCP Router	Automatic: 1	Automatic: 1 GB	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
CredHub	Automatic: 2	None	Automatic: large (cpu: 2, ram: 8 GB, disk: 16 GB)

4. To scale your deployment horizontally, increase the number of **Instances** of a job. For guidance on the number of job instances required to ensure high availability, see [Scaling Recommendations](#).
5. To scale your deployment vertically, adjust the **Persistent Disk Type** and **VM Type** of a job to allocate more disk space and memory. If you choose **Automatic** from the dropdown, TAS for VMs uses the recommended amount of resources for the job.
6. Click **Save**.
7. Return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes**.

## Scaling down TAS for VMs

If you are deploying a TAS for VMs configuration that does not need to be highly available, VMware recommends scaling down job instances to the minimum number required for a functional deployment.

To scale down your deployment:

1. Go to the Tanzu Operations Manager Installation Dashboard.

2. Click the TAS for VMs tile.
3. Select **Resource Config**.

JOB	INSTANCES	PERSISTENT DISK TYPE	VM TYPE
Consul	Automatic: 3	Automatic: 1 GB	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
NATS	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
File Storage	Automatic: 1	Automatic: 100 GB	Automatic: medium.mem (cpu: 1, ram: 6 GB, disk: 8 GB)
MySQL Proxy	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
MySQL Server	Automatic: 3	Automatic: 100 GB	Automatic: large.disk (cpu: 2, ram: 8 GB, disk: 64 GB)
Backup Prepare Node	Automatic: 1	Automatic: 200 GB	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Diego BBS	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
UAA	Automatic: 2	None	Automatic: medium.disk (cpu: 2, ram: 4 GB, disk: 32 GB)
Cloud Controller	Automatic: 2	None	Automatic: medium.disk (cpu: 2, ram: 4 GB, disk: 32 GB)
HAProxy	Automatic: 1	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Router	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
MySQL Monitor	Automatic: 1	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Clock Global	Automatic: 1	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Cloud Controller Worker	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Diego Brain	Automatic: 3	Automatic: 1 GB	Automatic: small (cpu: 1, ram: 2 GB, disk: 8 GB)
Diego Cell	Automatic: 3	None	Automatic: xlarge.disk (cpu: 4, ram: 16 GB, disk: 128 GB)
Loggregator Trafficcontroller	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Syslog Adapter	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Syslog Scheduler	Automatic: 2	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
Doppler Server	Automatic: 3	None	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
TCP Router	Automatic: 1	Automatic: 1 GB	Automatic: micro (cpu: 1, ram: 1 GB, disk: 8 GB)
CredHub	Automatic: 2	None	Automatic: large (cpu: 2, ram: 8 GB, disk: 16 GB)

4. In the **Resource Config** page, decrease the number of **Instances** for each job. Choose the suggested values outlined in [Scaling Recommendations](#) or in the [Scaling Recommendations for Specific Deployment Configurations](#).
5. Click **Save**.
6. Return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes**.

## Scaling down jobs with persistent disk

If you scale down or delete a job that uses persistent disk, TAS for VMs marks the disk as orphaned. Orphaned disks are not attached to any job, and TAS for VMs deletes them after five days.

Use the BOSH CLI to list and recover orphaned disks. Follow the instructions in [Advanced Troubleshooting with the BOSH CLI](#) to log in to the BOSH Director, and then follow the procedures in [Orphaned Disks](#) in the BOSH documentation.

## Scaling recommendations for specific deployment configurations

If you use one of the following configurations, choose the values in the corresponding table to scale instances for your particular deployment:

- [Deployments Using External Databases](#).
- [Deployments Using Internal MySQL](#).

- [Deployments Using an External Blobstore.](#)
- [Deployments Using External Load Balancers.](#)

## Deployments using external Databases

If you use an external database, you can scale down the instance counts for internal MySQL jobs.

Select the following values in the **Resource Config** pane:

Job	Instance Count
MySQL Server	0
MySQL Proxy	0

## Deployments using internal MySQL

If you use the internal MySQL database on a clean install, or on an upgrade from a configuration that previously used internal MySQL databases, you do not need to change the default values shown in the table below.

To revert back to this configuration, choose the values shown in the **Resource Config** pane.


**Important**

Changing back to this configuration deletes any data written to your other database option.

Job	Instance Count
MySQL Server	3
MySQL Proxy	2

Apps that do not use MySQL for VMware Tanzu are not affected by the scaling process when you redeploy TAS for VMs. In addition, redeploying TAS for VMs with the MySQL cluster means that the TAS for VMs API is unavailable for a brief period of time. For example, you are not able to push apps or query their state during this time.

For more information, see the [MySQL for VMware Tanzu](#) documentation.

## Deployments using an external blobstore

If you use an external blobstore, select the following value in the **Resource Config** pane:

Job	Instance Count
File Storage	0

## Deployments using external load balancers

If you use an external load balancer, select the following values in the **Resource Config** pane:

Job	Instance Count
Router	$\geq 1$
Diego Brain	$\geq 1$

For more information about configuring load balancers in the **Resource Config** pane of the TAS for VMs tile, see [Configuring load balancing for TAS for VMs](#).

## Scaling Cloud Controller

This topic describes how and when to scale BOSH jobs in CAPI, and includes details about some key metrics, heuristics, and logs.

To inform some scaling decisions, check current CPU values by running `bosh instances --ps --vitals`. The **CPU User** value corresponds with the `system.cpu.user` metric and is scaled by the number of CPUs. For example, on a 4-core `api` VM, a `cloud_controller_ng` process that is using 100% of a core is listed as using 25% in the `system.cpu.user` metric.

### cloud\_controller\_ng

The `cloud_controller_ng` Ruby process is the primary job in CAPI. It, along with `nginx_cc`, powers the Cloud Controller API that all users of VMware Tanzu Application Service for VMs (TAS for VMs) interact with. In addition to serving external clients, `cloud_controller_ng` also provides APIs for internal components within TAS for VMs, such as Loggregator and Networking subsystems.

The `cloud_controller_ng` web server can either be Puma (Default) or Thin (Deprecated). The characteristics of these web servers differ significantly. The Thin web server runs on a single process per VM, therefore scaling should be done horizontally by adding more VMs. Puma allows for multiple processes to run per VM, therefore scaling can be both vertical or horizontal.

## When to Scale

When you are determining whether to scale `cloud_controller_ng`, look for the following:

### Key Metrics

Cloud Controller emits the following metrics:

- `cc.requests.outstanding.gauge` or `cc.requests.outstanding` (deprecated)
  - Thin: is at or consistently near 20.
  - Puma: is at or consistently near the total number of available Puma threads on the VM. You can calculate this with `Puma Workers x Puma Max Threads`.
- `system.cpu.user`
  - Thin: is above 0.85 utilization of a single core on the API VM. This metric is scaled by number of cores. If the VM has more than 1 core, you can determine how much Thin is using of a single core by using the formula `system.cpu.user / (1 / Number of CPU Cores)`.
  - Puma: is above 0.85 total utilization.

- `cc.vitals.cpu_load_avg`
  - Thin: is 1 or higher.
  - Puma: is at the number of CPU cores or higher.
- `cc.vitals.uptime` is consistently low, indicating frequent restarts (possibly due to memory pressure).
- `cc_db_connection_pool_timeouts_total` indicates that the DB connection pool is too small which caused threads to wait and finally fail a request because no connection could be acquired within the timeout.
- `cc_db_connection_wait_duration_seconds` indicates that threads have to wait for free DB connections.



The above guidelines for Puma assume that the number of Puma workers is configured to be the same as the number of CPU cores on the VM - see [Scaling Puma Web Server](#) below. If you have configured Puma workers to be different than the number of CPU cores, you should adjust threshold calculations accordingly.

## Heuristic Failures

The following behaviors may occur:

- There is a latency in average response.
- Web UI responsiveness or timeouts are degraded.
- `bosh is --ps --vitals` has elevated CPU usage for the `cloud_controller_ng` job in the API instance group.

## Relevant Log Files

You can find the above heuristic failures in the following log files:

- `/var/vcap/sys/log/cloud_controller_ng/cloud_controller_ng.log`
- `/var/vcap/sys/log/cloud_controller_ng/nginx-access.log`

## How to Scale

Before and after you scale Cloud Controller API VMs, verify that the Cloud Controller database is not overloaded. All Cloud Controller processes are backed by the same database, so heavy load on the database impacts API performance regardless of the number of Cloud Controllers deployed. Cloud Controller supports both PostgreSQL and MySQL, so there is no specific scaling guidance for the database.

In TAS for VMs deployments with internal MySQL clusters, a single MySQL database VM with CPU usage over 80% can be considered overloaded. When this happens, the MySQL VMs must be scaled up to prevent the added load of additional Cloud Controllers exacerbating the issue.



Since Cloud Controller supports both PostgreSQL and MySQL external databases, there is no absolute guidance about what a healthy database looks like. In general, high database

CPU utilization is a good indicator of scaling issues, but always defer to the documentation specific to your database.

## Scaling Puma Web Server

When deployed with the Puma web server, Cloud Controller API VMs can be scaled both vertically and horizontally. Puma supports multiple processes per VM and so can scale with the number of CPU cores available.

Puma web server exposes the following configuration options. For more information see [Cloud Controller Configuration](#):

- `cc.puma.workers` - Number of workers for Puma webserver.
- `cc.puma_max_threads` - Maximum number of threads per Puma webserver worker.
- `cc.puma.max_db_connections_per_process` - Maximum database connections for Puma per process (main + Puma workers), if not set the ccng value is used (default).

The following are loose recommendations for setting these parameters:

- The number of workers should equal the number of CPU cores on the VM.
- The max number of threads should be between 5 and 20.
- The max number of DB Connections per process should be at least equal to the max number of threads. This ensures a thread always has a DB connection available. However, when choosing the max number of DB connections be aware that this is per Puma worker. You may estimate the total number of connections by `Number of VMs x Number of Workers x Max DB Connections Per Process`. For example, if you had 2 VMs with 4 workers and 10 max DB connections per process, you may have up to 80 DB connections. Be careful this does not exceed any Database limit.

If when switching to Puma you reduce the number of overall Cloud Controller API VMs, you may need to increase the number of Cloud Controller Local workers per VM to handle the increased load on the remaining API VMs. For more information, see [cloud\\_controller\\_worker\\_local](#).

## Scaling Thin Web Server

When deployed with the Thin web server, Cloud Controller API VMs should primarily be scaled horizontally. Scaling up the number of cores on a single VM is not effective. This is because Thin operates in a single process and Ruby's Global Interpreter Lock (GIL) limits the `cloud_controller_ng` process so that it can only effectively use a single CPU core on a multi-core machine.

### Adjusting DB connection pool

If there are any threads which had to wait for a free DB connection (indicated by `cc_db_connection_wait_duration_seconds`) it might be worth to increase the DB connection pool if possible. Threads waiting on free DB connections will cause delays in the web server's responses. \* Thin: Connection pool size can be configured with: `ccdb.max_connections` \* Puma: Connection pool size per process (main + workers) can be configured with: `cc.puma.max_db_connections_per_process`

In case threads failed to acquire a free DB connection within the configured timeout, `cc_db_connection_pool_timeouts_total` will be > 0. Then either the connection pool size or the number

of API VMs should be increased.

See [Cloud Controller Multi-Process Mode \(Puma\)](#) for more information on the differences between using Thin and Puma.

## cloud\_controller\_worker\_local

This job, also called “local workers”, is primarily responsible for handling files uploaded to the API VMs during `cf push`, such as `packages`, `droplets`, and resource matching.

### When to scale

When determining whether to scale `cloud_controller_worker_local`, look for the following:

#### Key metrics

Cloud Controller emits the following metrics:

- `cc.job_queue_length.cc-VM_NAME-VM_INDEX` is continuously growing.
- `cc.job_queue_length.total` is continuously growing.

#### Heuristic failures

The following behaviors may occur:

- `cf push` is intermittently failing.
- `cf push` average time is elevated.

#### Relevant log files

You can find the heuristic failures in the following log files:

- `/var/vcap/sys/log/cloud_controller_ng/cloud_controller_ng.log`

### How to scale

Because local workers are located with the Cloud Controller API job, they are scaled horizontally along with the API.

## cloud\_controller\_worker

Colloquially known as “generic workers” or just “workers”, this job and VM are responsible for handling asynchronous work, batch deletes, and other periodic tasks scheduled by the `cloud_controller_clock`.

### When to scale

When determining whether to scale `cloud_controller_worker`, look for the following:

#### Key metrics

Cloud Controller emits the following metrics:

- `cc.job_queue_length.cc-VM_TYPE-VM_INDEX` (ie. `cc.job_queue_length.cc-cc-worker-0`) is continuously growing.
- `cc.job_queue_length.total` is continuously growing.

## Heuristic failures

The following behaviors may occur:

- `cf delete-org ORG_NAME` appears to leave its contained resources around for a long time. Also, the command fails if the `-org ORG_NAME` contains shared private domains.
- Users report slow deletes for other resources.
- cf-acceptance-tests succeed generally, but fail during cleanup.

## Relevant log files

You can find the above heuristic failures in the following log files:

- `/var/vcap/sys/log/cloud_controller_worker/cloud_controller_worker.log`

## How to scale

The cc-worker VM can safely scale horizontally in all deployments, but if your worker VMs have CPU/memory headroom, you can also use the `cc.jobs.generic.number_of_workers` BOSH property to increase the number of worker processes on each VM.

## cloud\_controller\_clock and cc\_deployment\_updater

The `cloud_controller_clock` job runs Diego sync process and schedules periodic background jobs. The `cc_deployment_updater` job is responsible for handling v3 rolling app deployments. For more information, see [Rolling App Deployments](#).

## When to scale

When determining whether to scale `cloud_controller_clock` and `cc_deployment_updater`, look for the following:

### Key metrics

Cloud Controller emits the following metrics:

- `cc.Diego_sync.duration` is continuously increasing over time.
- `system.cpu.user` is high on the scheduler VM.

## Heuristic failures

The following behaviors may occur:

- Diego domains frequently lack freshness. For more information, see the [Domain Freshness](#) section in the *Overview of Domains* topic on GitHub.

- The Diego Desired LRP count is larger than the total process instance count reported through the Cloud Controller APIs.
- Deployments are slow to increase and decrease instance count.

### Relevant log files

You can find the above heuristic failures in the following log files:

- `/var/vcap/sys/log/cloud_controller_clock/cloud_controller_clock.log`
- `/var/vcap/sys/log/cc_deployment_updater/cc_deployment_updater.log`

### How to scale

Both of these jobs are singletons, so extra instances are for failover HA rather than scalability. Performance issues are likely due to database overloading or greedy neighbors on the scheduler VM.

## **blobstore\_nginx**

This is the internal WebDAV blobstore that comes included with TAS for VMs by default. It stores `packages`, staged `droplets`, `buildpacks`, and cached app resources. Files are typically uploaded to the internal blobstore through the Cloud Controller local workers and downloaded by Diego when app instances are started.

### When to scale

When determining whether to scale `blobstore_nginx`, look for the following:

#### Key metrics

Cloud Controller emits the following metrics:

- `system.cpu.user` is consistently high on the `singleton-blobstore` VM.
- `system.disk.persistent.percent` is high, indicating that the blobstore is running out of room for additional files.

#### Heuristic failures

The following behaviors may occur:

- `cf push` is intermittently failing.
- `cf push` average time is elevated.
- App droplet downloads are timing out or failing on Diego.

### Relevant log files

You can find the above heuristic failures in the following log files:

- `/var/vcap/sys/log/blobstore/internal_access.log`

## How to scale

The internal WebDAV blobstore cannot be scaled horizontally, not even for availability purposes, because of its reliance on the `singletont-blobstore` VM's persistent disk for file storage. For this reason, it is not recommended for environments that require high availability. For these environments, you should use an external blobstore. For more information, see [Cloud Controller blobstore configuration](#) and the [Blob storage](#) section of the *High Availability in Cloud Foundry* topic.

The internal WebDAV blobstore can be scaled vertically, so scaling up the number of CPUs or adding faster disk storage can improve the performance of the internal WebDAV blobstore if it is under high load.

High numbers of concurrent app container starts on Diego can cause stress on the blobstore. This typically happens during upgrades in environments with a large number of apps and Diego Cells. If vertically scaling the blobstore or improving its disk performance is not an option, limiting the max number of concurrent app container starts can mitigate the issue. For more information, see the [starting\\_container\\_count\\_maximum](#) section in the *auctioneer job from diego/2.29.0* topic in the BOSH documentation.

## Cloud Controller Multi-Process Mode

This page explains how the Cloud Controller API handles traffic in Single-Process vs. Multi-Process modes, how to migrate it from the older Single-Process mode to newer Multi-Process mode, and how running the Cloud Controller in Multi-Process mode affects how to scale it.

## How Cloud Controller Scaling Works

In Single-Process Mode, the CF API has been limited to scaling horizontally. The web server technology that Cloud Controller is built on top of, Thin, can only serve traffic using a single process.

With the introduction of Multi-Process support for Cloud Controller, operators can configure their foundations to use fewer VM instances to handle the same amount of traffic to the Cloud Controller API.

### Scaling in Single-Process Mode

Using Single-Process mode (powered by Thin), Cloud Controller cannot utilize more than a single process per VM. This is because Thin cannot use multiple processes to serve traffic on the same port at the same time.

In Single-Process mode, Cloud Controller sees little benefit by being deployed to a multiple-core machine, as Cloud Controller can only utilize a single core.

By default, Cloud Controller in Single-Process mode is configured to use 20 threads, meaning a single Cloud Controller process can comfortably handle 20 concurrent API requests before response time is slowed due to requests being stuck in the queue.

Once a foundation's API group is at its limit, the only way to support more HTTP requests is to add more API VMs.

Each Single-Process API instance has 2 colocated job queue workers (called 'local workers') to handle package and droplet uploads to the blobstore. It's generally sufficient for both the API process and the 2 local workers to run on a single core.

### Scaling in Multi-Process Mode

Using Multi-Process mode (powered by Puma), Cloud Controller can utilize multiple processes (called “workers”) to serve traffic on the same port.

Cloud Controller benefits from multiple workers only if there is a CPU core available to each worker.

By default, each worker is configured to use 10 threads, meaning that each worker can process up to 10 concurrent requests. We don’t recommend configuring more than 20 threads per worker.

More workers on an individual instance results in a higher memory utilization.



A single Puma worker with 20 threads is generally not as performant as a single Thin instance. However, a cluster of Puma workers is more performant than a group of individual Thin instances, because if one Puma worker is stalled or crashes, queued requests can be routed to the other workers.

You should configure each API instance to have twice as many local job workers as there are API workers. This can vary depending on foundation load. See [Scaling Local Workers](#) for more details.

## Enable Multi-Process Mode

Enable Multi-Process mode with the following settings, and see [Migrating from Single-Process to Multi-Process Mode](#) below for how to adjust VM type, instance count, workers, and threads/worker to account for and take advantage of the migration.

1. To enable Multi-Process mode, set the `cc.experimental.puma` property to `true`.
2. Set the `cc.puma.workers` to the number of CPU cores your machines have.
3. Set `cc.puma.max_threads` to the desired number of threads. We recommend at least 10.
4. Set `cc.puma.max_db_connections_per_process` to at least the same number of values as `cc.puma.workers`.

## Migrating from Single-Process to Multi-Process Mode

When upgrading your Cloud Controller API server from Single-Process to Multi-Process mode, ensure the API instance group can support the same number of concurrent requests.

Typically a Single-Process API instance will support 20 threads. To ensure parity when migrating to Multi-Process API instances, ensure that the total number of workers multiplied by the number of threads per worker is equal to (or greater than) the number of Single-Process instances multiplied by the number of threads (usually 20).

It’s recommended to initially over-allocate resources and then fine-tune resource allocations after migration, as described in [Post-Migration Fine-Tuning](#). For example, you might follow any or all of the following strategies:

- Provision one or more extra API instances than the above concurrent requests calculation would require
- Keep the thread count per worker less than 20
- Increase memory for your API instances by a factor of how many workers each instance will have in Multi-Process mode.

## Examples

Here are a few possible configurations that would result in similar number of threads:

	<b>Profile 1 (Thin)</b>	<b>Profile 2 (Puma)</b>	<b>Profile 3 (Puma)</b>	<b>Profile 4 (Puma)</b>
<b>VM type</b>	1 CPU	2 CPU	4 CPU	8 CPU
<b># instances</b>	20	10	8	4
<b># API workers</b>	1 (Thin)	2	4	7
<b># threads/worker</b>	20	20	13	15
<b>Total concurrent requests supported</b>	400	400	416	420

**Profile 1 (Thin):** A typical API instance group for Single-Process mode. The only recommended way to increase the maximum number of concurrent requests is to scale the number of instances.

**Profile 2 (Puma):** With only 2 cores, this profile is not taking full advantage of Multi-Process support. Since each worker is already configured to use 20 threads, this profile can only be scaled by increasing the number of machine cores or total instances.

**Profile 3 (Puma):** This profile can be scaled by increasing the number of cores, total instances, or threads.

**Profile 4 (Puma):** This profile only has 7 API workers for 8 CPU cores. This can be helpful, but not strictly necessary, to ensure colocated processes have enough CPU resources to run. This profile can be scaled by increasing the number of workers to 8 as well as number of cores, total instances, or threads. This profile will be the most demanding in terms of memory footprint.

## Configuring Your Foundation

First understand and configure the VM types with the desired number of cores for your Cloud Controller API VMs. To take advantage of multi-process cloud controller this should be set to a value greater than 1. You can do this by selecting the Resource Config page in Operations manager and configuring Cloud Controller.



Next, to enable Multi-Process mode, Enable “Cloud Controller web server utilizes multiple CPU cores” under the Cloud Controller section and choose whether to let Puma automatically set the number of Puma workers or to manually set the number of workers. Automatically setting the worker count is recommended, however if there are other processes that require CPU on the Cloud Controller VM it maybe prudent to have fewer Puma workers than CPU cores.

**Puma can be configured to automatically set the worker count based on the number of CPU cores (Recommended).**



Or worker count can be set manually



1. Choose Auto or Manual worker count
  - If manual worker count is selected, set the number of Puma workers. **Optional – only necessary if workers are not set to be automatically configured by Puma at run time**

2. Set Maximum number of threads per Puma Worker to the desired number of threads. We recommend at least 10.
3. Set Maximum database connections per Puma Worker to at least the same number of values as Maximum number of threads per Puma Worker
4. Set Number of local workers per API VM to the desired number of workers (recommended twice as many Puma Workers)

For more information, see [Configuring Cloud Controller](#).

## Other considerations

### DB Connections

The max number of DB Connections per process should be at least equal to the max number of threads. This ensures a thread always has a DB connection available. However, when choosing the max number of DB connections be aware that this is per Puma worker.

You may estimate the total number of CC API connections: `Number of VMs x Number of Puma Workers x Max DB Connections Per Process`.

For example, if you had 2 VMs with 4 workers and 10 max DB connections per process, you may have up to 80 DB connections. Be careful this does not exceed any Database limit, and note that there are other connections to the CF Database, such as CC workers, UAA, Diego etc.

### Number of API VMs

Puma allows for the number of Cloud Controller API VMs to be reduced. It is always recommended to have > 1 API VMs for redundancy, however having too few VMs can also cause issues. For example, if you only had 2 API VMs with Puma then during an upgrade, one would be temporarily taken offline and so you would lose 50% capacity during the time it takes for bosh to upgrade the VM. So consider general redundancy and loss of capacity during an upgrade when choosing the number of VMs.

However, reducing the number of VMs can speed up the total upgrade time of a deployment.

### Memory footprint

When using Puma there is an additional memory requirement to enable the clustering mode and for each worker. Each process loads a full copy of the Cloud Controller application code into its own memory space and does not share memory with other workers. As part of upgrading, it is advised to monitor the API VMs memory consumption.

### Metrics

Certain metrics are specific to Thin or Puma, for example

`thread_info.event_machine.resultqueue.num_waiting` on Thin and `cc_puma_worker_backlog` on Puma.

Puma also favors metrics in the Prometheus format. Therefore metrics may differ if using Thin or Puma and StatsD or Prometheus. For a full table of what is supported see

[https://docs.cloudfoundry.org/running/all\\_metrics.html#cc](https://docs.cloudfoundry.org/running/all_metrics.html#cc).

## Post-Migration Fine-Tuning

After upgrading, watch the following metrics to see if you can reduce or need to scale up your provisioned resources:

- `cc.requests.outstanding.gauge`: If this value is at or consistently near the total number of available Puma threads on the VM, you may need to scale your instance group.
- `system.cpu.user`: This value should stay below 0.85 total utilization.
- `cc.vitals.cpu_load_avg`: This value should stay below the total number of CPU cores.

## Configuring Diego Cell disk cleanup scheduling

You can use the disk cleanup process to remove unused layers from the Diego Cell disk.

The disk cleanup process removes all unused Docker image layers and old Operations Manager stacks, regardless of their size or age.

To perform a detailed analysis of disk usage in your VMware Tanzu Application Service for VMs deployment, see [Examining GrootFS Disk Usage](#).

## Why disk cleanup is needed

You can configure disk cleanup scheduling on Diego Cells in Operations Manager.

Operations Manager isolates app instances (AIs) from each other using containers that run inside Diego Cells. Containers enforce a set of isolation layers, including file system isolation. A Operations Manager container file system can either be a Operations Manager stack or the result of pulling a Docker image.

For performance reasons, the Diego Cells cache the Docker image layers and the Operations Manager stacks used by running AIs. When Operations Manager destroys an AI or reschedules an AI to a different Diego Cell, certain Docker image layers or an old Operations Manager stack becomes unused. If Operations Manager does not clean these unused layers, the cell ephemeral disk slowly fills.

## Options for disk cleanup

Operations Manager provides the following options for scheduling the disk cleanup process on Diego Cells in the **App Containers** pane of the TAS for VMs tile:

- **Never clean up disk space**: VMware does not recommend selecting this option for production environments.
- **Routinely clean up disk space**: This option makes the Diego Cell schedule a disk cleanup whenever a container is created. Running the disk cleanup process this frequently can result in a negative impact on the Diego Cell performance.
- **Clean up disk space once usage fills disk**: This option makes the Diego Cell schedule the disk cleanup process only when disk usage encroaches on the space reserved for other jobs.

For more information about these options, see [Configure Disk Cleanup Scheduling](#).

## Recommendations

To select the best option for disk cleanup, you must consider the workload that the Diego Cells run.

For Operations Manager installations that primarily run buildpack-based apps, VMware recommends selecting the **Routinely clean up disk space** option. The **Routinely clean up disk space** option ensures that when a new stack becomes available on a cell, the old stack is dropped immediately from the cache. Diego Cells then schedules a disk cleanup whenever a container is created.

For Operations Manager installations that primarily run Docker images, or both Docker images and buildpack based apps, VMware recommends selecting the **Clean up disk space once usage fills disk** option.

## Calculating a reserve

By default, the space reserved for other jobs is set to a reasonable value for the majority of Operations Manager deployments. The reserve default value accounts for the most typical deployment case where the only other component that writes to `/var/vcap/data` is the Diego executor cache.

However, if you are deploying any BOSH add-ons that require space in the ephemeral disk, you might need to increase the reserve.

For more information on disk usage and garbage collection in GrootFS, see [GrootFS Disk Usage](#) and [Examining GrootFS Disk Usage](#).



### Caution

Setting the reserve to an excessive value can cause garbage collection to occur more frequently. An increase in frequency can result in regular slowdowns in performance of apps on particular Diego Cells. VMware recommends leaving the default value for the reserve unless you are advised to edit it.

## Configure disk cleanup scheduling

1. Go to the Operations Manager [Operations Manager Installation Dashboard](#).
2. Click the VMware Tanzu Application Service for VMs tile, and go to [App Containers](#).
3. In **Diego Cell disk cleanup scheduling**, select an option.
4. If you select **Clean up disk space once usage fills disk**, you can edit the **Reserved disk space for other jobs** field. VMware recommends that you leave the default value of `15360` MB, or 15 GB, in **Reserved disk space for other jobs** unless you are instructed to change it. For more information, see [Calculating a Reserve](#).
5. Click **Save**.

If you are configuring TAS for VMs for the first time, return to your specific IaaS configuration to continue the installation process.

If you are editing an existing TAS for VMs installation, return to the [Ops Manager Installation Dashboard](#), click **Review Pending Changes**, and click **Apply Changes**.

## Examining GrootFS disk usage in TAS for VMs

You can analyze GrootFS disk space usage in TAS for VMs. The following information gives you important background knowledge and the steps to analyze GrootFS disk space usage.

You run the commands as root on any BOSH-deployed VM that hosts the Garden job in a VMware Tanzu Application Service for VMs (TAS for VMs) deployment.

The following information provides different commands depending on whether you are using privileged or unprivileged containers in your deployment. By default, all deployments use unprivileged containers. For more information about these container types, see [Container Security](#).

For more information about the GrootFS concepts, see [GrootFS Disk Usage](#).

## Reconciling container and host disk usage

To reconcile disk allocations for containers with the actual disk usage on the host VM, you need to understand how GrootFS uses its disk.

Command line tools such as `du` and `df` can provide misleading information because of the way container file systems work.

For example, the following situations can occur:

If...	Then...
the Diego cell rep appears to be out of disk capacity, but the actual disk usage on the Garden host is low	Diego does not schedule containers on the cell.
the Diego cell rep appears to have available disk capacity, but the combined space used by containers and system components prevents Diego from allocating the remaining disk space	Diego continues to place containers on the cell, but they fail to start.

## About container disk usage

On disk, the read write layer for each container can be found at  
`/var/vcap/data/grootfs/store/unprivileged/images/CONTAINER-ID/diff`.

When GrootFS calls on the built in XFS quota tooling to get disk usage for a container, it takes into account data written to that directory and not the data in the read only volumes.

Running `grootfs stats` returns the following values:

- `total_bytes_used`: Disk usage of the container **including** the rootfs image volumes.
- `exclusive_bytes_used`: Disk usage of the container **not including** the rootfs image volumes.

## Retrieve Disk Usage Stats for a single container

To obtain the disk usage stats of a single container, use the following steps:

1. In your TAS for VMs deployment, use `bosh ssh` to connect to the BOSH deployed VM running the Garden job.
2. On the VM, run the following command to look up the container ID:

```
ls /var/vcap/data/garden/depot/
```

The previous command returns a container ID in the following format:

55afb65-5cbf-49c6-4461-f803

3. Based on the container type used in your deployment, run one of the following commands on the VM.

- For unprivileged containers, run the following command:

```
/var/vcap/packages/grootfs/bin/grootfs --config \
/var/vcap/jobs/garden/config/grootfs_config.yml stats CONTAINER-ID
```

Where `CONTAINER-ID` corresponds to the container ID you obtained in step 2.

For example:

```
$ /var/vcap/packages/grootfs/bin/grootfs --config \
/var/vcap/jobs/garden/config/grootfs_config.yml stats 55afb65-5c
bf-49c6-4461-f803
```

- For privileged containers, run the following command:

```
/var/vcap/packages/grootfs/bin/grootfs --config \
/var/vcap/jobs/garden/config/privileged_grootfs_config.yml stats CONTAIN
E-R-ID
```

Where `CONTAINER-ID` corresponds to the container ID you obtained in step 2.

For example:

```
$ /var/vcap/packages/grootfs/bin/grootfs --config \
/var/vcap/jobs/garden/config/privileged_grootfs_config.yml stat
s 55afb65-5cbf-49c6-4461-f803
```

The previous commands return output in the following format:

```
{"disk_usage": {"total_bytes_used": 23448093, "exclusive_bytes_used": 819
2}}
```

## Retrieve exclusive disk usage stats for all running containers

To verify the disk usage of all running containers, use the following steps:

1. In your TAS for VMs deployment, use `bosh ssh` to connect to the BOSH deployed VM running the Garden job.
2. Based on the container type used in your deployment, run one of the following commands on the VM:
  - For unprivileged containers, run the following command:

```
ls /var/vcap/data/garden/depot/ \
| xargs -I{} /var/vcap/packages/grootfs/bin/grootfs --config \
/var/vcap/jobs/garden/config/grootfs_config.yml stats {} \
| cut -d: -f4 | cut -d} -f1 | awk '{sum += $1} END {print sum}'
```

- For privileged containers, run the following command:

```
ls /var/vcap/data/garden/depot/ \
| xargs -I{} /var/vcap/packages/grootfs/bin/grootfs --config \
/var/vcap/jobs/garden/config/privileged_grootfs_config.yml stats {} \
| cut -d: -f4 | cut -d} -f1 | awk '{sum += $1} END {print sum}'
```

The previous commands return the total disk usage in bytes for all running containers.

## About volumes in GrootFS

Underlying layers are known as `volumes` in GrootFS.

They are read only and the changesets are layered together through an **OverlayFS** mount to create the rootfs for containers. When GrootFS writes each file system volume to disk, it also stores the number of bytes written to a file in the `meta` directory.

### Check volume disk size

To find out the size of an individual volume, you can read the corresponding metadata file or run `du` on the volume itself:

1. In your TAS for VMs deployment, use `bosh ssh` to connect to the BOSH deployed VM running the Garden job.
2. Based on the container type used in your deployment, run one of the following commands on the VM:
  - For unprivileged containers, run the following command on the VM:

```
cat /var/vcap/data/grootfs/store/unprivileged/meta/volume-VOLUME-SHA
```

Where `VOLUME-SHA` corresponds to the SHA value of the volume.

- For privileged containers, run the following command:

```
cat /var/vcap/data/grootfs/store/privileged/meta/volume-VOLUME-SHA
```

Where `VOLUME-SHA` corresponds to the SHA value of the volume.

The `cat` commands above return the volume size in bytes in the following format:

```
{"Size":5607885}
```

3. Alternatively, use `du` and pass the absolute path to the volume. Run one of the following commands on the VM:

- For unprivileged containers, run the following command:

```
du -sch /var/vcap/data/grootfs/store/unprivileged/volumes/VOLUME-SHA/
```

Where `VOLUME-SHA` corresponds to the SHA value of the volume.

- For privileged containers, run the following command:

```
du -sch /var/vcap/data/grootfs/store/privileged/volumes/VOLUME-SHA/
```

Where `VOLUME-SHA` corresponds to the SHA value of the volume.

The `du` commands return the volume size in the following format:

```
5.4M /var/vcap/data/grootfs/store/unprivileged/volumes/VOLUME-SHA/
```

## Determine disk usage and reclaimable disk space

This section describes how to calculate the amount of disk space is in use and estimate how much space is reclaimable.

### Calculate disk use by all active volumes

For each container, GrootFS mounts the underlying volumes using overlay to a point in the `images` directory. This point is the rootfs for the container and is read write.

GrootFS also stores the SHA of each underlying volume used by an image in the `meta` folder.

You can determine the bytes of all active volumes on disk by running one of the following commands:

If you do not have `python3` installed, replace `python3` with `python` in the following commands.

- For unprivileged containers, run the following command:

```
for image in $(ls /var/vcap/data/grootfs/store/unprivileged/meta/dependencies/image\.*.json); \
do cat $image | python3 -c 'import json,sys;obj=json.load(sys.stdin); \
print("\n".join(obj))' ; done | sort -u \
| xargs -I{} cat /var/vcap/data/grootfs/store/unprivileged/meta/volume-{} \
| cut -d : -f 2 | cut -d} -f1 \
| awk '{sum += $1} END {print sum}'
```

- For privileged containers, run the following command:

```
for image in $(ls /var/vcap/data/grootfs/store/privileged/meta/dependencies/image\.*.json); \
do cat $image | python3 -c 'import json,sys;obj=json.load(sys.stdin); \
print("\n".join(obj))' ; done | sort -u \
| xargs -I{} cat /var/vcap/data/grootfs/store/privileged/meta/volume-{} \
| cut -d : -f 2 | cut -d} -f1 \
| awk '{sum += $1} END {print sum}'
```

The previous commands return the total number of bytes used by all active volumes on disk.

### Calculate GrootFS store disk usage

To determine how much total disk space the store is using, run the following command:

```
df | grep -E "/var/vcap/data/grootfs/store/(privileged|unprivileged)$" \
| awk '{sum += $3} END {print sum}'
```

The preceding command returns the total number of bytes used by the store.

### Calculate reclaimable disk space

You can use values gathered from the commands above to calculate how much space can be cleared in GrootFS. Garbage collection reclaims disk space by pruning unused volumes.

The overall formula to calculate reclaimable disk space is to subtract the total disk in use by the store from the total disk used by active volumes.

For example, perform the following steps:

1. Calculate how much disk space the store is using by following the instructions in [Calculate GrootFS Store Disk Usage](#). For example, your result might be:

```
Total disk store = 5607885 bytes
```

2. Calculate how much disk space active volumes are using by following the instructions in [Calculate Disk Use by All Active Volumes](#). For example, your result might be:

```
Active volumes = 3212435 bytes
```

3. Subtract the amount of space used by active volumes from the space used by the store. For example, your result might be:

```
5607885 - 3212435 = 2395450 bytes
```

In this example, you can reclaim 2395450 bytes through garbage collection.

## How GrootFS reclaims disk space

The thresholder component calculates and sets a value so that GrootFS's garbage collector can attempt to ensure that a small reserved space is kept free for other jobs. GrootFS only tries to garbage collect or reclaim space when that threshold is reached. However, if all the rootfs layers are actively in use by images, then garbage collection cannot occur and that space is used up.

If you determine that there is not enough reclaimable disk and more space is needed on disk, you can scale up your VMs to a larger size or add more VMs to provide more disk space.

Alternatively, you can configure a lower threshold for Diego Cell disk cleanup in TAS for VMs. For more information, see [Configuring Diego Cell Disk Cleanup Scheduling](#).

## Other categories of GrootFS disk usage

There might be categories of GrootFS disk usage other than those listed in the above sections. However, the bulk of disk usage is stored in the `images/CONTAINER-ID/diff` and `volumes` directories, so these are rarely taken into consideration when calculating store usage.

You can find these directories under `/var/vcap/data/grootfs/store/unprivileged` for unprivileged containers and `/var/vcap/data/grootfs/store/privileged` for privileged containers.

GrootFS also stores information in the following directories:

- `1`: link directories. Shorter directory names are symlinked to volume directories to allow Groot to union mount more file paths.
- `locks`: file system lock directory to ensure safety during concurrent cleans and creates.
- `meta`: per image and volume metadata.

- `projectids`: empty numbered directories used to track image quotas.
- `tmp`: normal temporary directory contents.

These directories typically use less than 2 MB disk in total.

## Using metadata in TAS for VMs

You can use metadata in TAS for VMs and gives you instructions for adding, updating, removing, and viewing metadata.

### About metadata

VMware Tanzu Application Service for VMs (TAS for VMs) allows you to add metadata to resources such as spaces and apps. You can use metadata to provide additional information about the resources in your TAS for VMs deployment. This can help with operating, monitoring, and auditing.

For example, you can tag resources with metadata that describes the type of environment they belong to. You can also use metadata to describe app characteristics, such as front end or back end. Other examples include billing codes, points of contact, resource consumption, and information about security or risk.

### Methods of adding metadata

You can add metadata to resources using any of the following methods:

- **Cloud Foundry Command Line Interface (cf CLI) v7:** For procedures using this method of adding metadata, see [cf CLI Procedures](#). For more information about cf CLI v7, see [Upgrading to cf CLI v7](#).
- **Cloud Foundry API (CAPI):** For procedures using this method of adding metadata, see [API procedures](#). For more information about adding metadata with CAPI, see [Metadata in the CAPI documentation](#).

You can add metadata to apps and spaces using Apps Manager. For more information, see [Managing Apps and Service Instances Using Apps Manager](#). For more information about adding metadata to spaces using Apps Manager, see [Managing orgs and spaces Using Apps Manager](#).

### Types of metadata

You can add two types of metadata to resources in TAS for VMs:

- **Labels:** Labels allow you to identify and select TAS for VMs resources. For example, if you label all apps running in production or all spaces that contain Internet-facing apps, you can then search for them.
- **Annotations:** Annotations allow you to add non-identifying metadata to TAS for VMs resources. You cannot query based on annotations. Also, there are fewer restrictions for key-value pairs of annotations than there are for labels. For example, you can include contact information of persons responsible for the resource, or tool information for debugging purposes.

#### Annotations sent to service brokers

For installations using CAPI v1.108.0 and later, TAS for VMs sends annotations with key prefixes to service brokers when service instances and service bindings are created.

When a service instance is created, TAS for VMs sends the following annotations to service brokers:

- `organization_annotations`
- `space_annotations`
- `instance_annotations`

When a service instance is bound to an app, TAS for VMs also sends `app_annotations` to service brokers.

For more information about the annotations listed above, see [Cloud Foundry Context Object](#) in the Open Service Broker API Profile on GitHub.

For more general information about annotations, see [Annotations](#) in the CAPI documentation.

## Metadata Requirements

The following tables describe requirements for creating metadata.

### Requirements for labels

The following table describes the requirements for creating labels:

Label requirements			
Part of Label	Length in characters	Allowed characters	Other Requirements
(Optional) Key Prefix	0-253	<ul style="list-style-type: none"> <li>• Alphanumeric ( <code>\[a-z0-9A-Z\]</code> )</li> <li>• <code>-</code></li> <li>• <code>.</code></li> </ul>	<ul style="list-style-type: none"> <li>• DNS subdomain format, with at least one <code>.</code></li> <li>• Must end with <code>/</code></li> </ul>
Key Name	1-63	<ul style="list-style-type: none"> <li>• Alphanumeric ( <code>\[a-z0-9A-Z\]</code> )</li> <li>• <code>-</code></li> <li>• <code>_</code></li> <li>• <code>.</code></li> </ul>	Must begin and end with an alphanumeric character
Value	0-63	<ul style="list-style-type: none"> <li>• Alphanumeric</li> <li>• <code>-</code></li> <li>• <code>_</code></li> <li>• <code>.</code></li> </ul>	<ul style="list-style-type: none"> <li>• Must begin and end with an alphanumeric character</li> <li>• Empty values allowed</li> </ul>

### Requirements for annotations

The following table describes the requirements for creating annotations:

Annotation Requirements			
Part of Annotation	Length in characters	Allowed characters	Other Requirements
(Optional) Key Prefix	0-253	<ul style="list-style-type: none"> <li>• Alphanumeric ( \[a-z0-9A-Z\] )</li> <li>• -</li> <li>• .</li> </ul>	<ul style="list-style-type: none"> <li>• DNS subdomain format, with at least one .</li> <li>• Must end with /</li> </ul>
Key Name	1-63	<ul style="list-style-type: none"> <li>• Alphanumeric ( \[a-z0-9A-Z\] )</li> <li>• -</li> <li>• _</li> <li>• .</li> </ul>	Must begin and end with an alphanumeric character
Value	0-5000	Any unicode character	n/a

## Metadata key prefixes

You can ensure that a label or annotation key is easily differentiated from other keys by using a prefix. A prefix is a namespacing pattern that helps you more clearly identify resources. Prefixes are in DNS subdomain format. For example, `prefix.example.com`.

Consider an example in which you have two scanner tools: one for security and one for compliance. Both tools use a `scanned` label or annotation. You can disambiguate between the two tools using a prefix. The security tool can prefix a label or annotation with `security.example.com/scanned` and the compliance tool can prefix a label or annotation with `compliance.example.com/scanned`.

## cf CLI procedures

The following sections describe how to add, update, view, and list metadata using the cf CLI.

To see which resources are supported for this feature, run `cf labels -h`. cf CLI v7 supports adding labels to apps, orgs, spaces, buildpacks, stacks, routes, domains, and various service resources.

### Add metadata to a resource

This section describes how to add metadata using the cf CLI.

#### Add a label

To add a label to a resource:

1. Run:

```
cf set-label RESOURCE RESOURCE-NAME KEY=VALUE
```

Where:

- `RESOURCE` is the type of resource you want to label, such as `app` or `space`.

- `RESOURCE-NAME` is the name of the resource you want to label, such as `example-app`.
- `KEY` is the key for the label.
- `VALUE` is the corresponding value for the label key. You can enter multiple key-value pairs in the same command.

## Update metadata for a resource

To update metadata for a resource, follow the procedure for adding metadata and provide a new value for an existing key. For more information, see [Add metadata to a resource](#).

## Remove metadata from a resource

This section describes how to remove metadata using the cf CLI.

### Remove a label

To remove a label from a resource:

1. Run:

```
cf unset-label RESOURCE RESOURCE-NAME KEY
```

Where:

- `RESOURCE` is the type of resource you want to remove the label from, such as `app` or `space`.
- `RESOURCE-NAME` is the name of the resource you want to remove the label from , such as `example-app`.
- `KEY` is the key for the label.

## View metadata for a resource

This section describes how to view metadata with the cf CLI.

### View labels

To view labels for a resource:

1. Run:

```
cf labels RESOURCE RESOURCE-NAME
```

Where:

- `RESOURCE` is the type of resource you want to remove the label from, such as `app` or `space`.
- `RESOURCE-NAME` is the name of the resource you want to remove the label from , such as `example-app`.

### Select resources by labels

To select resources by labels:

1. Run:

```
cf apps --labels 'environment in (production,staging),tier in (backend)'
```

## API procedures

The following sections describe how to add, update, remove, list, and query metadata using CAPI.

### Add metadata to a resource

The following sections describe how to add labels and annotations to resources.

#### Add a label

To add a label to a resource using CAPI:

1. Run:

```
cf curl v3/RESOURCE-ENDPOINT/GUID \
-X PATCH \
-d '{
  "metadata": {
    "labels": {
      "LABEL-KEY": "LABEL-VALUE"
    }
  }
}'
```

Where:

- **RESOURCE-ENDPOINT** is the CAPI endpoint for the type of resource you want to label, such as `apps` or `organizations`.
- **GUID** is the GUID of the resource you want to label.
- **LABEL-KEY** is the key for the label.
- **LABEL-VALUE** is the corresponding value for the label key.

#### Add an annotation

To add an annotation:

1. Run:

```
cf curl v3/RESOURCE-ENDPOINT/GUID \
-X PATCH \
-d '{
  "metadata": {
    "annotations": {
      "ANNOTATION-KEY": "ANNOTATION-VALUE"
    }
  }
}'
```

Where:

- RESOURCE-ENDPOINT is the CAPI endpoint for the type of resource you want to label, such as `apps` or `organizations`.
- GUID is the GUID of the resource you want to label.
- ANNOTATION-KEY is the key for the label.
- ANNOTATION-VALUE is the corresponding value for the annotation key.

## Update metadata for a resource

To update metadata for a resource, follow the procedure for adding metadata and provide a new value for an existing key. For more information, see [Add metadata to a resource](#).

## Remove metadata from a resource

To remove metadata from a resource, follow the procedure for adding metadata and provide a `null` value for an existing key. For more information, see [Add metadata to a resource](#).

## View metadata for a resource

To view metadata using the list endpoint of a resource:

1. Run:

```
cf curl /v3/RESOURCE-ENDPOINT/GUID
```

Where:

- RESOURCE-ENDPOINT is the CAPI endpoint for the type of resource you want to view, such as `apps` or `organizations`.
- GUID is the GUID of the resource you want to view.

## List resources by querying labels

To list resources by querying label metadata:

1. To query a resource by using the `label_selector` parameter on its list endpoint, run:

```
cf curl /v3/RESOURCE-ENDPOINT/?label_selector=SELECTOR-REQUIREMENTS
```

Where:

- RESOURCE-ENDPOINT is the CAPI endpoint for the type of resource you want to view, such as `apps` or `organizations`.
  - SELECTOR-REQUIREMENTS is one of requirement types specified in [Selector Requirement Reference](#). You can add multiple selector requirements using a comma-separated list.
- Ensure that this part of the URL is appropriately escaped.

### Selector requirement reference

The following table describes how to form selector requirements:

Requirement	Format	Description
existence	<code>KEY</code>	Returns all resources labeled with the given key
inexistence	<code>!KEY</code>	Returns all resources not labeled with the given key
equality	<code>KEY==VALUE</code> or <code>KEY=VALUE</code>	Returns all resources labeled with the given key and value
inequality	<code>KEY!=VALUE</code>	Returns all resources not labeled with the given key and value
set inclusion	<code>KEY in (VALUE1,VALUE2...)</code>	Returns all resources labeled with the given key and one of the specified values
set exclusion	<code>KEYnotin (VALUE1,VALUE2...)</code>	Returns all resources not labeled with the given key and one of the specified values

## Example: Label resources with a git commit

This section provides the following:

- A procedure for labeling an app, package, and droplet with a Git commit SHA. For more information, see [Manually Label Resources](#).
- A script that automates the procedure. For more information, see [Automate Labeling Resources](#).

Labeling your app and related resources with a Git commit SHA allows you to track which version of your code is running on TAS for VMs.

For more information about app packages and droplets, see the [CAPI documentation](#).

### Manually label resources

To label an app, droplet, and package with a Git commit SHA:

1. Run:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of the app.

2. Record the app GUID you retrieved in the previous step,
3. Return the GUID of the droplet and package associated with the app by running:

```
cf curl /v3/apps/APP-GUID/droplets/current
```

Where `APP-GUID` is the GUID of the app.

4. Record the GUID of the droplet and package:
  - The droplet GUID is the value for the `"guid"` key.
  - The package GUID is the end of the `"href"` URL for the `"package"` key.

For example, the droplet and package GUIDs are highlighted in blue in the following output:

```
{
  "guid": "fd35633f-5c5c-4e4e-a5a9-0722c970a9d2",
  ...
  "links": {
    "package": {
      "href": "https://api.run.pivotal.io/v3/packages/fd35633f-5c5c-4e4e-a5a9-0722c970a9d2"
    }
  }
}
```

5. Label the app with a Git commit SHA by running:

```
cf curl /v3/apps/APP-GUID -X PATCH -d '{"metadata": { "labels": { "commit": COMMIT-SHA } } }'
```

Where:

- APP-GUID is the GUID of the app.
- COMMIT-SHA is the SHA of the Git commit.

6. Label the app droplet with the same Git commit SHA by running:

```
cf curl /v3/droplets/DROPLET-GUID -X PATCH -d '{"metadata": { "labels": { "commit": COMMIT-SHA } } }'
```

Where:

- DROPLET-GUID is the GUID of the droplet.
- COMMIT-SHA is the SHA of the Git commit.

7. Label the app package with the same Git commit SHA by running:

```
cf curl /v3/packages/PACKAGE-GUID -X PATCH -d '{"metadata": { "labels": { "commit": COMMIT-SHA } } }'
```

Where:

- PACKAGE-GUID is the GUID of the package.
- COMMIT-SHA is the SHA of the Git commit.

## Automate labeling resources

You can automate labeling resources by running a script either programmatically or manually in the app repository.

### Prerequisite

To run the following example script, you must install jq. To download jq, see [jq](#).

### Example script

The following script retrieves the GUID of the app, droplet, and package. It then `curls` CAPI to label each resource with the current Git commit SHA.

Replace `APP-NAME` with the name of your app.

```
#!/usr/bin/env bash

set -ex

APP_GUID=$(cf app APP-NAME --guid)
APP_URI="/v3/apps/${APP_GUID}"

DROPLET_GUID=$(cf curl "/v3/apps/${APP_GUID}/droplets/current" | jq -r .guid)
DROPLET_URI="/v3/droplets/${DROPLET_GUID}"

PACKAGE_GUID=$(cf curl "/v3/droplets/${DROPLET_GUID}" | jq -r .links.package.href | xargs basename)
PACKAGE_URI="/v3/packages/${PACKAGE_GUID}"

COMMIT_SHA=$(git rev-parse --short HEAD)
REQUEST_BODY=$(jq -nc --arg commit "${COMMIT_SHA}" '{"metadata": { "labels": { "commit": $commit } } }')

cf curl "${APP_URI}" -X PATCH -d "${REQUEST_BODY}"
cf curl "${PACKAGE_URI}" -X PATCH -d "${REQUEST_BODY}"
cf curl "${DROPLET_URI}" -X PATCH -d "${REQUEST_BODY}"
```

## Example: Add custom tags to log and metric envelopes

Log and metric envelopes emitted by applications are tagged with information about the application, such as the application name, for example.

You can define additional custom log and metric tags by adding a label with a specific prefix. The default prefix is `metric.tag.cloudfoundry.org`. Following a restart of the application, the custom metric tag is visible in the logs and metrics emitted for processes associated with that application.

The following commands add a tag named `custom_tag` with the value `some_value` for logs and metrics emitted for the application `sample-app`:

```
$ cf set-label app sample-app metric.tag.cloudfoundry.org/custom_tag=some_value
$ cf restart sample-app
```

You can verify that the custom tag has been applied by querying Log Cache with the log-cache cf CLI plugin. The following commands assume that you have the `jq` command line utility.

```
$ cf install-plugin -r CF-Community 'log-cache'

$ cf tail sample-app --json --follow | jq -r '.tags.custom_tag'
some_value
some_value
some_value
```

## Custom branding Apps Manager

As a Operations Manager operator, you can brand Apps Manager by changing certain text, colors, and images on the interface. Developers see the customized interface when logging in, creating an account, resetting a password, or using Apps Manager.

You can customize Apps Manager by configuring the **Custom Branding** and **Apps Manager Config** pages of the VMware Tanzu Application Service for VMs (TAS for VMs) tile.

Company Name  
  Defaults to 'Pivotal'

Accent Color  
 Enter a hexadecimal color code like '#71ffda'

Main Logo (PNGs only)  
 Enter a base64-encoded PNG image string, but leave out the mime-type (data:image/png;base64,) string. Only enter the base64 encoded data.

Square Logo (PNGs only)  
 Enter a base64-encoded PNG image string, but leave out the mime-type (data:image/png;base64,) string. Only enter the base64 encoded data.

Favicon (PNGs only)  
 Enter a base64-encoded PNG image string, but leave out the mime-type (data:image/png;base64,) string. Only enter the base64 encoded data.

Footer Text  
 Defaults to 'Pivotal Software Inc. All rights reserved.'

Footer Links  
You may configure up to three links in the Apps Manager footer.

Classification Header/Footer Background Color  
 Enter a hexadecimal color code like '#71ffda'

Classification Header/Footer Text Color  
 Enter a hexadecimal color code like '#71ffda'

Classification Header Content  
 Plain text or HTML Markup

## Custom Branding pane

To customize your Apps Manager interface:

1. In a browser, go to the fully-qualified domain name (FQDN) of your Tanzu Operations Manager deployment and log in.
2. Click the TAS for VMs tile.
3.  **Select Custom Branding.**
4. For **Organization name**, enter the name of your organization. If left blank, the name defaults to **VMware**.
5. For **Accent color**, enter the hexadecimal code for the color used to accent various visual elements, such as the currently selected space in the sidebar. For example, `#71ffda`.
6. For **Main logo**, enter a Base64 encoded URL string for a PNG image, leaving out the mime-type (`data:image/png;base64,`), to use as your main logo. The image can be square or wide. If left blank, the image defaults to the VMware logo.
7. For **Square logo**, enter a Base64 encoded URL string for a PNG image, leaving out the mime-type (`data:image/png;base64,`), to use in the Apps Manager header and in places that require a smaller logo. If left blank, the image defaults to the VMware logo.
8. For **Favicon**, enter a Base64 encoded URL string for a PNG image, leaving out the mime-type (`data:image/png;base64,`), to use as your favicon. If left blank, the image defaults to the VMware logo.
9. For **Footer text**, enter a string to be displayed as the footer. If left blank, the footer text defaults to **VMware Software, Inc; All rights reserved**.
10. To add up to three footer links that appear to the right of the footer text:
11. Click **Add**.
12. For **Link text**, enter a label for the link.
13. For **URL**, enter an external or relative URL. For example, `https://docs.vmware.com/` or `/tools.html`.
14. For special notification purposes such as governmental or restricted usage, use the **Classification** fields to create a special header and footer:
  - For **Header and footer background color**, enter the hexadecimal code for the desired background color of the header and footer.
15. For **Header and footer text color**, enter the hexadecimal code for the desired color of header and footer text.
16. For **Header text**, enter content for the header in either plain text or HTML. If you enter HTML content, eliminate white spaces and new lines. If you do not provide any content, the custom header does not appear.
17. For **Footer text**, enter content for the footer in either plain text or HTML. If you enter HTML content, eliminate white spaces and new lines. If you do not provide any content, the custom footer does not appear. This footer appears under the normal footer, which you can customize in the **Footer text** and **Footer links** fields.

The header and footer do not appear on the UAA log in page.

## Apps Manager pane

To continue customizing your Apps Manager interface:

1. In a browser, go to the FQDN of your Tanzu Operations Manager and log in.
2. Click the TAS for VMs tile.
3. Select **Apps Manager**.
4. For **Product name**, enter text to replace **Apps Manager** in the header and the title of Apps Manager. This text defaults to **Apps Manager** if left blank.
5. For **Marketplace name**, enter text to replace the header in the Marketplace pages. This text defaults to **Marketplace** if left blank.
6. By default, Apps Manager includes three secondary navigation links: **Marketplace**, **Docs**, and **Tools**. You can edit existing secondary navigation links by clicking the name of the link and editing the **Link text** and **URL** fields. You can also remove the link by clicking the trash icon next to its name. If you want to add a new secondary navigation link, click **Add** and complete the **Link text** and **URL** fields.



### Important

Removing any of the default links removes them from the secondary navigation for all users.

7. For **Apps Manager buildpack**, enter a static content-compatible buildpack you want TAS for VMs to use when deploying the Apps Manager app. By default, this is `staticfile_buildpack`.
8. For **Search Server buildpack**, enter a Node.js-compatible buildpack you want TAS for VMs to use when deploying the Search Server app. By default, this is `nodejs_buildpack`.
9. For **Invitations buildpack**, enter a Node.js-compatible buildpack you want TAS for VMs to use when deploying the Invitations app. By default, this is `nodejs_buildpack`.
10. (Optional) Enter in MB your desired **Apps Manager memory usage**. The minimum number you can enter is `128`. Leave this field blank to use the default value of 128 MB.
11. (Optional) Enter in MB your desired **Search Server memory usage**. This is the memory limit used to deploy the Search Server app. The minimum number you can enter is `256`. Leave this field blank to use the default value of 256 MB.
12. (Optional) Enter in MB your desired **Invitations memory usage**. This is the memory limit used to deploy the Invitations app. The minimum number you can enter is `256`. Leave this field blank to use the default value of 256 MB.
13. The **Apps Manager polling interval** field provides a temporary fix if Apps Manager usage degrades Cloud Controller response times. In this case, you can use this field to reduce the load on the Cloud Controller and ensure Apps Manager remains available while you troubleshoot the Cloud Controller.

VMware recommends that you do not keep this field modified as a long term fix because it can degrade Apps Manager performance.

Optionally, you can:

14. Increase the polling interval to the default of 30 seconds.

If you enter a value between `0` and `30`, the field is automatically set to `30`.

- Deactivate polling by entering `0`. This stops Apps Manager from refreshing data automatically, but you can update displayed data by reloading Apps Manager manually.

15. The **App details polling interval** field provides an additional way to reduce the load on the Cloud Controller when the **Apps Manager polling interval** field is not sufficient. This field controls the rate at which Apps Manager polls for data when a user views the **Overview** page of an app.

VMware recommends that you do not keep this field modified as a long term fix because it can degrade Apps Manager performance.

Optionally, you can:

16. Increase the polling interval to the default of 10 seconds. If you enter a value between `0` and `30`, the field is automatically set to `10`.

- Deactivate polling by entering `0`. This stops Apps Manager from refreshing data automatically, but you can update displayed data by reloading Apps Manager manually.

## Planning TAS for VMs orgs and spaces

This topic tells you about the considerations for effectively planning foundations, orgs, and spaces. You can plan your orgs and spaces to make the best use of the authorization features in VMware Tanzu Application Service for VMs (TAS for VMs).

An installation of TAS for VMs is referred to as a *foundation*. Each foundation has *orgs* and *spaces*. For more information, see [Orgs, Spaces, Roles, and Permissions](#).

The TAS for VMs roles described in *Orgs, Spaces, Roles, and Permissions* use the principle of least privilege. Each role exists for a purpose and features in TAS for VMs enable these purposes.

Consider these roles when planning your foundations, orgs, and spaces. This allows for full use of the features and assumptions of TAS for VMs.

## How TAS for VMs layers relate to your company

The following sections describe what TAS for VMs layers are and how they relate to your company structure.

### Overview of TAS for VMs layers

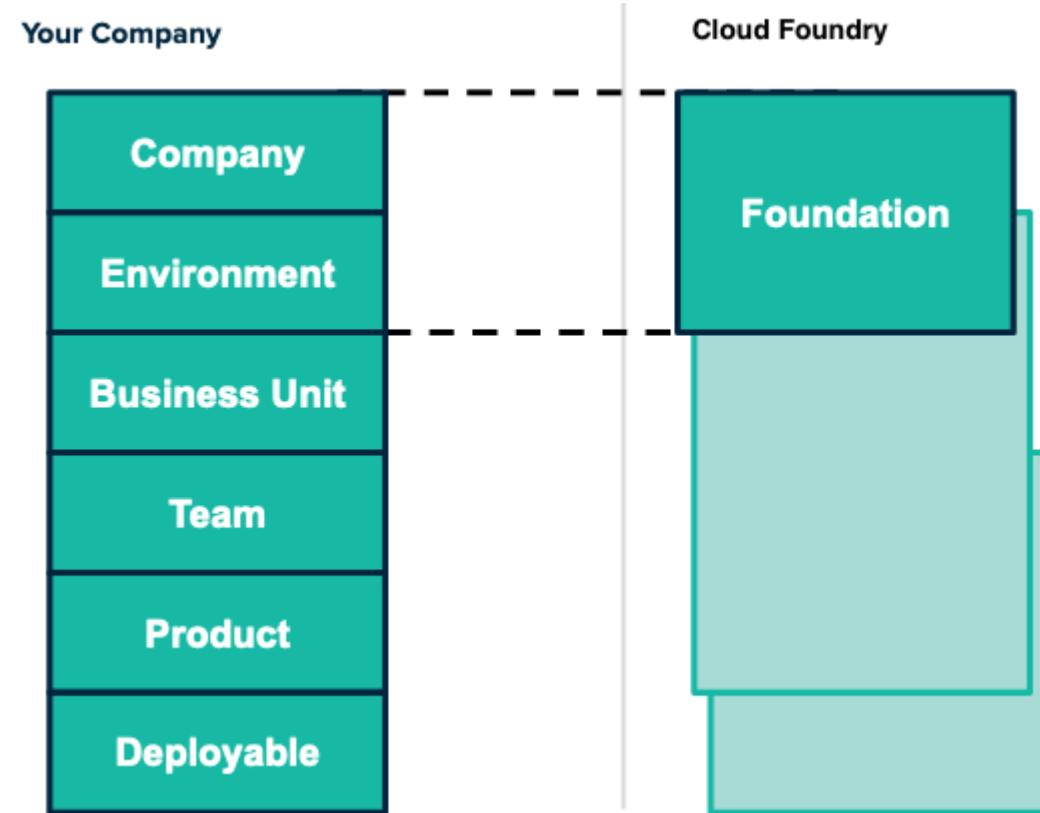
For an overview of each of the structural TAS for VMs layers, see the following table:

TAS for VMs Layer	Challenge to Maintain	Contains	Description	Roles
Foundations	Hardest	Orgs	For shared components: domains, service tiles, and the physical infrastructure	Admin, Admin Read-Only, Global Auditor

TAS for VMs Layer	Challenge to Maintain	Contains	Description	Roles
Orgs	Average	Spaces	A group of users who share a resource quota plan, apps, services availability, and custom domains	Org Manager, Org Auditor, Org Billing Manager
Spaces	Easiest	Apps	A shared location for app development, deployment, and maintenance	Space Manager, Space Developer, Space Auditor

## Foundations

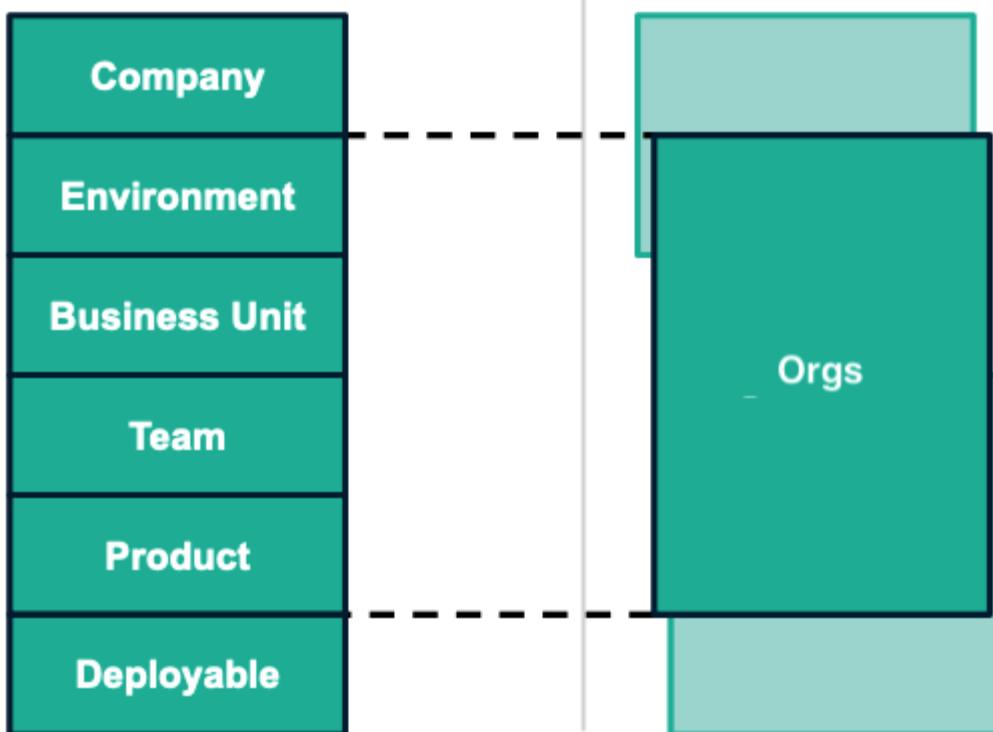
Foundations roughly map to a company and environments. For an illustration, see the following diagram:



## Orgs

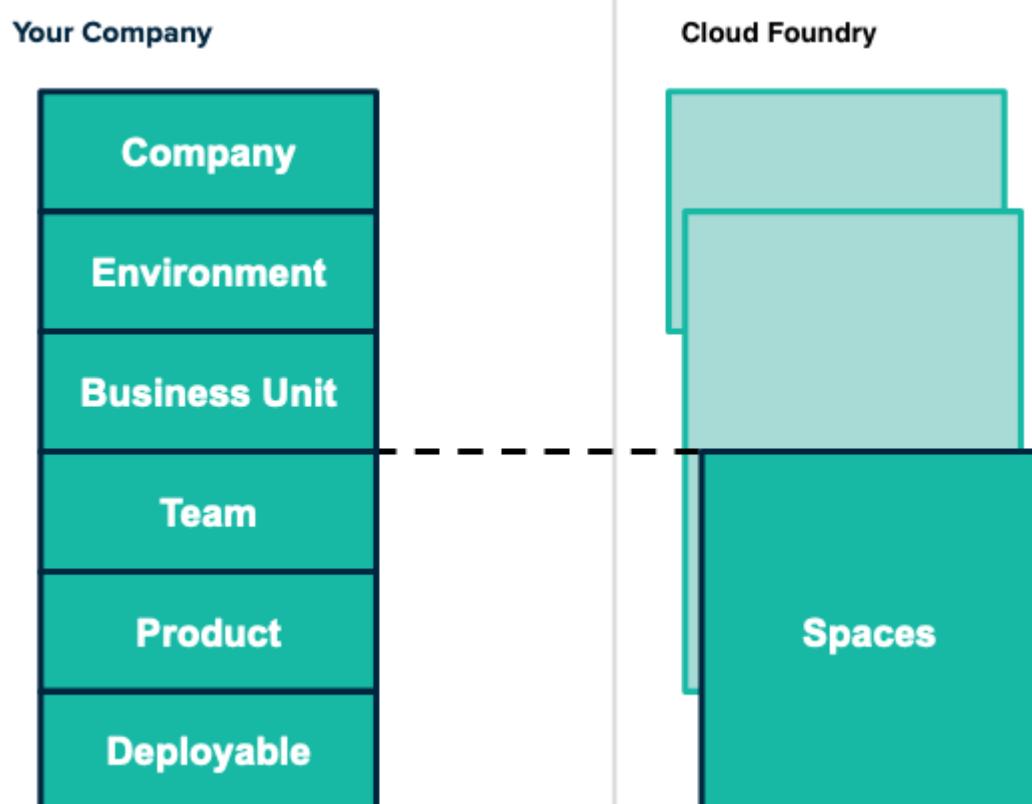
Orgs often map to a business unit in a particular foundation. To understand how you can map your company structure to a TAS for VMs org, see the following diagram:

## Your Company      Cloud Foundry



## Spaces

Spaces can encompass teams, products, and specific deployables. To understand how you can map your company structure to a TAS for VMs space, see the following diagram:



# Mapping considerations

The following sections describe considerations you can make when mapping foundations, orgs, and spaces.

## Planning for your environment

To effectively plan your environments, you must decide at what TAS for VMs layer they belong.

Broad environments, such as production environments, are commonly mapped to a foundation. More specific environments are mapped to an org or space.

Because of the large human cost to maintaining a foundation, you might see foundations mapped to production and staging environments separately.

For examples of environments and how they map to TAS for VMs layers, see the following table:

TAS for VMs Layer	Examples of Environments
Foundations	Production, Non-production, Sandbox
Orgs and Spaces	Development, UAT, QA

## Questions to consider about each TAS for VMs layer

For guiding questions to help you make decisions about planning your TAS for VMs structure, see the following table:

TAS for VMs Layer	Questions to Consider
Foundation	<ul style="list-style-type: none"> <li>How many foundations can your platform team create, update, and monitor?</li> <li>How much isolation does your organization require?</li> <li>Do you need foundations local to a particular cloud or IaaS environment?</li> </ul>
Org	<ul style="list-style-type: none"> <li>How do you plan for capacity needs and changes?</li> <li>What groups need to self-organize together?</li> <li>How do you measure cost and perform billing and chargeback?</li> </ul>
Space	<ul style="list-style-type: none"> <li>Are teams building single apps or constellations of microservices?</li> <li>Are teams building a portfolio of apps or standalone apps?</li> <li>When a new space can be created or destroyed?</li> <li>What developer processes require the sandboxed isolation?</li> <li>Do all apps need public routes?</li> <li>What apps need to share the same service instance?</li> </ul>

## Mapping larger and smaller subsets

*Subsets* are the company divisions you decide to map to TAS for VMs. When creating your subsets, consider that the lower the TAS for VMs layer, the more specific you want to map your subsets. Conversely, the higher the TAS for VMs layer, the broader you want to make your subsets.

For more information about mapping larger subsets for each TAS for VMs layer, see the following table:

TAS for VMs Layer	The impact of mapping larger subsets of your company
Foundations	<ul style="list-style-type: none"> <li>• Less maintenance</li> <li>• Less isolation</li> <li>• Better use of shared platform components</li> </ul>
Orgs	<ul style="list-style-type: none"> <li>• Less quota micromanagement</li> <li>• Ability to delegate user onboarding</li> <li>• More likely there are people with divergent needs</li> <li>• BU must be platform trained and manage potentially many spaces</li> </ul>
Spaces	<ul style="list-style-type: none"> <li>• More likelihood of accidental changes to someone else's app or service</li> <li>• Easier integration between apps</li> <li>• More apps can use non-public routes</li> </ul>

For more information about mapping smaller subsets for each TAS for VMs layer, see the following table:

TAS for VMs Layer	The impact of mapping smaller subsets of your company
Foundations	<ul style="list-style-type: none"> <li>• More maintenance, which could be offset with platform automation</li> <li>• Higher likelihood of foundations being different</li> <li>• More isolation</li> </ul>
Orgs	<ul style="list-style-type: none"> <li>• More quota management from platform team</li> <li>• More freedom to create spaces as needed</li> </ul>
Spaces	<ul style="list-style-type: none"> <li>• More app isolation</li> <li>• Security with more specific ASGs</li> <li>• More reliant on external services or service instance sharing</li> </ul>

## Orgs, spaces, roles, and permissions in Cloud Foundry

This topic tells you about orgs and spaces in VMware Tanzu Application Service for VMs (TAS for VMs) foundations. It also describes the default permissions for user roles in TAS for VMs.

TAS for VMs uses a role-based access control (RBAC) system to grant appropriate permissions to TAS for VMs users.

Admins, Org Managers, and Space Managers can assign user roles using the Cloud Foundry Command Line Interface (cf CLI). For more information, see [Users and Roles](#) in *Getting Started with the cf CLI* or [Managing User Roles with Apps Manager](#).

## Orgs

An org is a development account that an individual or multiple collaborators can own and use. All collaborators access an org with user accounts, which have roles such as Org Manager, Org Auditor, and Org Billing Manager. Collaborators in an org share a resource quota plan, apps, services availability, and custom domains.

By default, an org has the status of *active*. An admin can set the status of an org to *suspended* for various reasons such as failure to provide payment or misuse. When an org is suspended, users cannot perform certain activities within the org, such as push apps, modify spaces, or bind services.

For more information about the actions that each role can perform, see [User Roles](#) and [User Role Permissions](#).

For details on what activities are allowed for suspended orgs, see [Roles and Permissions for Suspended Orgs](#).

## Spaces

A space provides users with access to a shared location for app development, deployment, and maintenance. An org can contain multiple spaces. Every app, service, and route is scoped to a space. Roles provide access control for these resources and each space role applies only to a particular space.

Org managers can set quotas on the following for a space:

- Usage of paid services
- Number of app instances
- Number of service keys
- Number of routes
- Number of reserved route ports
- Memory used across the space
- Memory used by a single app instance
- Log volume per second used across the space

## User roles

A user account represents an individual person within the context of a TAS for VMs foundation. A user can have one or more roles. These roles define the user's permissions in orgs and spaces.

Roles can be assigned different scopes of User Account and Authentication (UAA) privileges. For more information about UAA scopes, see [Scopes in User Account and Authentication \(UAA\) Server](#).

The following describes each type of user role in TAS for VMs:

- **Admin:** Perform operational actions on all orgs and spaces using the Cloud Controller API. Assigned the `cloud_controller.admin` scope in UAA.
- **Admin Read-Only:** Read-only access to all Cloud Controller API resources. Assigned the `cloud_controller.admin_read_only` scope in UAA.
- **Global Auditor:** Read-only access to all Cloud Controller API resources except for secrets, such as environment variables. The Global Auditor role cannot access those values. Assigned the

`cloud_controller.global_auditor` scope in UAA.

- **Org Managers:** Administer the org.
- **Org Auditors:** Read-only access to user information and org quota usage information.
- **Org Users:** Read-only access to the list of other org users and their roles. In the v2 Cloud Controller API, when an Org Manager gives a person an Org or Space role, that person automatically receives Org User status in that org. This is no longer the case in the V3 Cloud Controller API.
- **Space Managers:** Manage a space within an org.
- **Space Developers:** Manage apps, services, and space-scoped service brokers in a space.
- **Space Auditors:** Read only access to a space.
- **Space Supporters:** Troubleshoot and debug apps and service bindings in a space.

The Space Supporter role is only available for the Cloud Controller V3 API. If a user with this role tries to access a V2 endpoint, the API returns a 403.

For non-admin users, the `cloud_controller.read` scope is required to view resources, and the `cloud_controller.write` scope is required to create, update, and delete resources.

Before you assign a space role to a user, you must assign an org role to the user. The error message `Server error, error code: 1002, message: cannot set space role because user is not part of the org` occurs when you try to set a space role before setting an org role for the user.

## User role permissions

Each user role includes different permissions in a TAS for VMs foundation. The following sections describe the permissions associated with each user role in both active and suspended orgs in TAS for VMs.

### Roles and permissions for active orgs

The following table describes the default permissions for various TAS for VMs roles in active orgs.

You can use feature flags to edit some of the default permissions in the following table. For more information, see [Using Feature Flags](#).

Activity	Admin	Admin Read- Only	Global Auditor	Org Manager	Org Auditor	Space Manager	Space Developer	Space Auditor	Space Supporter
Scope of operation	Org	Org	Org	Org	Org	Space	Space	Space	Space
Add and edit users and roles	Yes			1		1			
View users and roles	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Create and assign org quota plans		Yes							

Activity	Admin	Admin Read-Only	Global Auditor	Org Manager	Org Auditor	Space Manager	Space Developer	Space Auditor	Space Supporter
View org quota plans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Create orgs	Yes			2	2	2	2	2	2
View all orgs	Yes	Yes	Yes						
View orgs where user is a member	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes <sup>3</sup>	Yes	Yes	Yes	Yes	Yes	Yes
Edit, rename, and delete orgs	Yes			Yes <sup>4</sup>					
Suspend or activate an org	Yes								
Create and assign space quota plans	Yes			Yes					
Create spaces	Yes			Yes					
View spaces	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Edit spaces	Yes			Yes		Yes			
Delete spaces	Yes			Yes					
Rename spaces	Yes			Yes		Yes			
View the status, number of instances, service bindings, and resource use of apps	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Add private domains <sup>5</sup>	Yes			Yes					
Deploy, run, and manage apps	Yes					Yes		Yes <sup>8</sup>	
Use app SSH <sup>6</sup>	Yes					Yes			
Instantiate services	Yes					Yes			
Bind services to apps	Yes					Yes		Yes	
Manage global service brokers	Yes								

Activity	Admin	Admin Read-Only	Global Auditor	Org Manager	Org Auditor	Space Manager	Space Developer	Space Auditor	Space Supporter
Manage space-scoped service brokers	Yes					Yes		Yes	
Associate routes <sup>5</sup> , modify resource allocation of apps	Yes					Yes		Yes	
Rename apps	Yes					Yes			
Create and manage Application Security Groups	Yes								
Create, update, and delete an Isolation Segment	Yes								
List all Isolation Segments for an org	Yes	Yes	Yes <sup>7</sup>						
Entitle or revoke an Isolation Segment	Yes								
List all orgs entitled to an Isolation Segment	Yes	Yes	Yes <sup>7</sup>						
Assign a default Isolation Segment to an org	Yes		Yes						
List and manage Isolation Segments for spaces	Yes			Yes					
List entitled Isolation Segment for a space	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes

Activity	Admin	Admin Read-Only	Global Auditor	Org Manager	Org Auditor	Space Manager	Space Developer	Space Auditor	Space Supporter
List the Isolation Segment on which an app runs	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes

<sup>1</sup>Not by default, unless feature flag `set_roles_by_username` is set to `true`.

<sup>2</sup>Not by default, unless feature flag `user_org_creation` is set to `true`.

<sup>3</sup>Admin, admin read-only, and global auditor roles do not need to be added as members of orgs or spaces to view resources.

<sup>4</sup>Org Managers can rename their orgs and edit some fields; they cannot delete orgs.

<sup>5</sup>Unless disabled by feature flags.

<sup>6</sup>This assumes that SSH is enabled for the platform, space, and app. For more information, see [SSH access control hierarchy](#).

<sup>7</sup>Applies only to orgs to which the user account belongs.

<sup>8</sup>Cannot create packages or delete resources. For more information, see the [Cloud Controller API V3 Documentation](#).

## Roles and permissions for suspended orgs

The following table describes roles and permissions applied after an operator sets the status of an org to *suspended*.

Activity	Admin	Admin Read-Only	Global Auditor	Org Manager	Org Auditor	Space Manager	Space Developer	Space Auditor
Scope of operation	Org	Org	Org	Org	Org	Space	Space	Space
Add and edit users and roles	Yes							
View users and roles	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Create and assign org quota plans	Yes							
View org quota plans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Create orgs	Yes							
View all orgs	Yes	Yes	Yes					
View orgs where user is a member	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Activity	Admin	Admin Read-Only	Global Auditor	Org Manager	Org Auditor	Space Manager	Space Developer	Space Auditor
Edit, rename, and delete orgs	Yes							
Suspend or activate an org	Yes							
Create and assign space quota plans	Yes							
Create spaces	Yes							
View spaces	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Edit spaces	Yes							
Delete spaces	Yes							
Rename spaces	Yes							
View the status, number of instances, service bindings, and resource use of apps	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Add private domains <sup>†</sup>	Yes							
Deploy, run, and manage apps	Yes							
Instantiate and bind services to apps	Yes							
Associate routes <sup>†</sup> , modify resource allocation of apps	Yes							
Rename apps	Yes							
Create and manage Application Security Groups	Yes							

## CPU entitlement in TAS for VMs

Learn how CPU entitlements work in VMware Tanzu Application Service for VMs (TAS for VMs) and how to configure them.

To watch an overview of the topic, see [CPU Entitlements in Cloud Foundry](#) on YouTube.

CPU entitlement describes the percentage of host CPU a particular app instance is *entitled* to use. The CPU entitlement plug-in shows that apps have a CPU performance of 100% when they are using exactly the CPU they are entitled. Apps have a CPU performance of less than 100% when their usage is less than their entitlement and greater than 100% when they are above their entitlement.

In TAS for VMs, apps have CPU entitlements that are proportional to their allocated memory by default. For example, an app with access to 256MB of memory on a 512MB machine has access to half of the memory on the machine and is also entitled to half of the CPU of that machine.

## Spare CPU resources and throttling

If there are three cores on the Diego Cell to which your app is deployed, 300% CPU can be distributed between all the apps on the Diego Cell. This is the percentage that the `cf app` command displays. The metrics depend on factors such as the capacity of the Diego Cell and the total number of apps on it that are not visible to the user. This can make it difficult for users and operators to balance CPU resources.

An app always receives 100% of its CPU entitlement, no matter what other apps are on the Diego Cell. If there are spare resources on the machine, an app can consume over 100% CPU.

CPU burst optimization is turned off by default. Go to the **App Containers** tab and select **Allow CPU burst optimization**.

### Without CPU burst optimization

When CPU Burst Optimization is turned off, all apps on the cell share any spare CPU resources.

### With CPU burst optimization

When CPU Burst Optimization is turned on, “good” apps get bursting priority over “bad” apps. Good apps are apps that, on average, stay within their CPU entitlement. Bad apps are apps that, on average, exceed their CPU entitlement.

For example, a Diego Cell with 5 bad apps and 1 good app. Initially the 5 “bad” apps split all of the spare CPU resources evenly. If the good app needs to burst, it is given priority for all the extra CPU it needs. If the good app continues bursting for long enough, and on average it exceeds its CPU entitlement, then it becomes a bad app. Then all 6 “bad” apps share the spare CPU resources equally. Likewise, if one of the bad apps stops using so much CPU it becomes a good app again.

## Enabling Developers

In this section:

- [Using Docker in TAS for VMs](#)
- [Using Docker registries](#)
- [Enabling volume services](#)
- [Managing service brokers](#)
- [Managing access to service plans](#)
- [Dashboard Single Sign-on](#)
- [Using feature flags](#)
- [Managing custom buildpacks](#)
- [Supporting WebSockets](#)
- [Enabling W3C tracing](#)

- [Enabling Zipkin tracing](#)

## Using Docker in TAS for VMs

You can activate Docker support so TAS for VMs can deploy and manage apps based on Docker container images.

For information about Diego, the VMware Tanzu Application Service for VMs (TAS for VMs) component that manages app containers, see [Diego Components and Architecture](#). For information about how TAS for VMs developers push apps with Docker images, see [Deploying an App with Docker](#).

### Activate Docker image support

By default, apps deployed with the `cf push` command run in TAS for VMs containers based on standard filesystems that come bundled with PCF. With Docker support activated, TAS for VMs can also deploy and manage apps based on Docker container images.

To deploy Docker-image-based apps, developers run `cf push` with the `--docker-image` option and the location of a Docker image from which to create the containers. For information about how TAS for VMs developers push apps with Docker images, see [Push a Docker Image](#).

To activate Docker support on a TAS for VMs deployment, you must:

- Activate the `diego_docker` feature flag.
- Configure access to any Docker registries that you want to use images from.

Configuring these properties requires admin-level access to the TAS for VMs deployment, and cannot be done by individual app developers.

### Enable and deactivate the `diego_docker` feature flag

The `diego_docker` feature flag governs whether a TAS for VMs deployment supports Docker-image-based containers.

To activate Docker image support, run:

```
cf enable-feature-flag diego_docker
```

To deactivate Docker image support, run:

```
cf disable-feature-flag diego_docker
```

Deactivating the `diego_docker` feature flag stops all Docker-image-based apps in your deployment within a few convergence cycles, on the order of a one minute.

### Configure Docker registry access

To support Docker-image-based apps, TAS for VMs needs the ability to access Docker registries using either a Certificate Authority or an IP address allow list. For information about configuring this access, see [Installing Certificates on VMs](#).

### Docker image contents

A Docker image consists of a collection of layers. Each layer consists of one or both of the following:

- Raw bits to download and mount. These bits form the file system.
- Metadata that describes commands, users, and environment for the layer. This metadata includes the `ENTRYPOINT` and `CMD` directives, and is specified in the Dockerfile.

## How Garden-runC creates containers

Diego currently uses Garden-runC to construct Linux containers.

Both Docker and Garden-runC use libraries from the [Open Container Initiative \(OCI\)](#) to build Linux containers. After creation, these containers use name space isolation, or *namespaces*, and control groups, or *cgroups*, to isolate processes in containers and limit resource usage. These are common kernel resource isolation features used by all Linux containers.

Before Garden-runC creates a Linux container, it creates a file system that is mounted as the root file system of the container. Garden-runC supports mounting Docker images as the root file systems for the containers it creates.

When creating a container, both Docker and Garden-runC:

- Fetch and cache the individual layers associated with a Docker image.
- Combine and mount the layers as the root file system.

These actions produce a container whose contents exactly match the contents of the associated Docker image.

For earlier versions of Diego using Garden-Linux, see [Garden](#).

## How Diego runs and monitors processes

After Garden-runC creates a container, Diego runs and monitors the processes inside of it.

To determine which processes to run, the Cloud Controller fetches and stores the metadata associated with the Docker image. The Cloud Controller uses this metadata to:

- Run the start command as the user specified in the Docker image.
- Instruct Diego and the Gorouter to route traffic to the lowest-numbered port exposed in the Docker image, or port 8080 if the Dockerfile does not explicitly expose a listen port.

For more information about Cloud Controller, see [Cloud Controller](#).

For more information about Gorouter and the routing tier, see [TAS for VMs Routing Architecture](#).

For more information about exposed ports in Docker images, see the [Expose](#) section of the *Dockerfile reference* topic in the Docker documentation.

When you launch an app on Diego, the Cloud Controller honors any user specified overrides. For example, a custom start command or custom environment variables.

## Docker security concerns in a multi-tenant environment

The attack surface area for a Docker-image-based container that runs on Diego remains somewhat higher than that of a buildpack app because Docker allows you to fully specify the contents of your root file

systems. A buildpack app runs on a trusted root filesystem.

Garden-runC provides features that allow the platform to run Docker images more securely in a multitenant context. In particular, TAS for VMs uses the “user-namespacing” feature found on modern Linux kernels to ensure that users cannot gain escalated privileges on the host even if they escalate privileges within a container.

The Cloud Controller always runs Docker containers on Diego with user namespaces enabled. This security restriction prevents certain features, for example, the ability to mount FuseFS devices, from working in Docker containers. Docker apps can use fuse mounts through volume services, but they cannot directly mount fuse devices from within the container.

For more information about volume services, see [Using an External File System \(Volume Services\)](#).

To mitigate security concerns, VMware run only trusted Docker containers on the platform. By default, the Cloud Controller does not allow Docker based apps to run on the platform.

## Using Docker registries

You can configure Operations Manager to access Docker registries such as [Docker Hub](#), by using either a root certificate authority (CA) certificate or by adding its IP address to an allowlist. It also explains how to configure Operations Manager to access Docker registries through a proxy.

Docker registries store Docker container images. Operations Manager uses these images to create the Docker containers that it runs apps in.

## Prerequisite: Enable Docker support

Operations Manager can only access Docker registries if you have activated Docker support with the `cf enable-feature-flag diego_docker` command, as described in the [Enable Docker](#) section of the *Using Docker in TAS for VMs* topic.

With Docker activated, developers can push an app with a Docker image using the Cloud Foundry Command Line Interface (cf CLI). For more information, see [Deploying an App with Docker](#).

## Use a CA certificate

If you provide your root CA certificate in the Tanzu Operations Manager configuration:

1. In the Tanzu Operations Manager Installation Dashboard, click the **BOSH Director** tile.
2. Click **Security**.

3. In the **Trusted Certificates** field, paste one or more root CA certificates. The Docker registry does not use the CA certificate itself but uses a certificate that is signed by the CA certificate.
4. Click **Save**.
5. Select one of the following:
  - If you are configuring Tanzu Operations Manager for the first time, return to your specific IaaS installation instructions ([AWS](#), [Azure](#), [GCP](#), [OpenStack](#), [vSphere](#)) to continue the installation process.
  - If you are editing an existing Tanzu Operations Manager installation, return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes**.

After configuration, BOSH propagates your CA certificate to all application containers in your deployment. You can then push and pull images from your Docker registries.

## Use an IP address allow List

If you choose not to provide a CA certificate, you must provide the IP address of your Docker registry.

Using an allow list skips SSL validation. If you want to enforce SSL validation, enter the IP address of the Docker registry in the **No proxy** field described in [Configure Operations Manager to Access Proxies for Docker Registries](#).

To configure an IP address allow list with the IP address of your Docker registry:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the VMware Tanzu Application Service for VMs (TAS for VMs) tile.
3. Select **App Containers**.

4. Select **Allow SSH access to app containers** to activate app containers to accept SSH connections. If you use a load balancer, you must open port 2222 on your load balancer to activate SSH traffic. To open an SSH connection to an app, a user must have Space Developer privileges for the space where the app is deployed. Operators can grant those privileges in Apps Manager or using the cf CLI. If you select this option, it allows SSH access across your entire TAS for VMs deployment.
  5. For **Docker registry allow list**, provide the hostnames or IP addresses and ports of Docker registries in which TAS for VMs can run app instances. Enter hostnames or IP addresses and ports as a comma-separated list. SSL validation is ignored for Docker image registries secured with self-signed certificates at these locations.
  6. Under **Diego Cell disk cleanup scheduling**, select one of the following options listed. For more information about these options, see [Configuring Docker Images Disk-Cleanup Scheduling](#).
    - **Never clean up disk space**
    - **Routinely clean up disk space**
    - **Clean up disk space once threshold is reached.** If you choose this option, enter the amount of disk space limit the Diego Cell must reach before disk cleanup initiates under **Reserved disk space for other jobs**.
7. Click **Save**.
8. Do one of the following:
    - If you are configuring Tanzu Operations Manager for the first time, return to your specific IaaS installation instructions ([AWS](#), [Azure](#), [GCP](#), [OpenStack](#), [vSphere](#)) to continue the installation process.
    - If you are editing an existing TAS for VMs installation, return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes**.

After configuration, TAS for VMs allows Docker images to pass through the specified IP address without checking certificates.

## Configure Operations Manager to access proxies for Docker registries

If you have proxies already set up for Docker registries, you should configure Operations Manager to access your Docker registries through a proxy.

To configure Operations Manager to access a Docker registry through a proxy:

1. On the Installation Dashboard, go to **Username**; then click **Settings**, followed by **Proxy Settings**.
2. On the **Update Proxy Settings** pane, complete one of the following fields:
  - **HTTP proxy:** If you have an HTTP proxy server for your Docker registry, enter its IP address.
  - **HTTPS proxy:** If you have an HTTPS proxy server for your Docker registry, enter its IP address.

- **No proxy:** If you do not use a proxy server, enter the IP address for the Docker registry. This field might already contain proxy settings for the BOSH Director.
- Enter multiple IP addresses as a comma-separated list.
3. Click **Update**.
  4. Return to the Tanzu Operations Manager dashboard, click **Review Pending Changes**, and click **Apply Changes**.

## Enabling volume services

You can use VMware Tanzu Application Service for VMs (TAS for VMs) to deploy NFS or SMB volume services.

A volume service gives apps access to a persistent filesystem, such as NFS or SMB. By performing the procedures in this topic, you can add a volume service to the Marketplace that provides an NFS filesystem or an SMB share. For more information about adding a volume service to the Marketplace, see [Services](#).

Developers can then use the Cloud Foundry Command Line Interface (cf CLI) to create service instances of the volume service and bind them to their apps. For more information, see [Using an External File System \(Volume Services\)](#).

You must have a running NFS or SMB server to test NFS or SMB volume services. TAS for VMs packages the necessary software to provide app connectivity to remote network-attached storage (NAS), but does not supply the NAS itself.

## Enable NFS volume services

To activate NFS volume services in TAS for VMs:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **App Containers**.
4. Under **NFSv3 volume services**, select **Allow**.



### Note

In a clean install, NFS volume services are activated by default. In an upgrade, NFS volume services match the setting of the previous deployment.

1. (Optional) To configure LDAP for NFS volume services:

If you already use an LDAP server with your network-attached storage (NAS) file server, enter the information in the following fields. This ensures that the identities known to the file server match those checked by the NFS driver.

- For **LDAP service account user**, enter either the full domain name for the service account or the user name of the service account that manages volume services. This value must be what you enter when binding the account to your LDAP server.
- For **LDAP service account password**, enter the password for the service account.

- For **LDAP server host**, enter the hostname or IP address of the LDAP server.
- For **LDAP server port**, enter the LDAP server port number. The default port is 389.
- For **LDAP user search base**, enter the location in the LDAP directory tree from which any LDAP user search begins. The typical LDAP search base matches your domain name. For example, a domain named `cloud.example.com` typically uses the following LDAP user search base: `ou=Users,dc=example,dc=com`.

Additionally, your LDAP user records must be configured with an attribute `objectClass: User`, which is used by the NFS driver to identify records as user records. They must also have `uidNumber` and `gidNumber` fields, which are used to establish the correct UID for a named user.

- (Optional) For **LDAP server CA certificate**, you can enter a Certificate Authority (CA) certificate if your LDAP server supports TLS. Enter a certificate if you want to activate TLS connections from the NFS driver to your LDAP server. This is the CA certificate that your LDAP server uses to verify the TLS certificates for NFS. Paste in the root certificate from your CA certificate or your self-signed certificate.

2. Click **Save**.
3. Return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes** to redeploy.
4. Using the cf CLI, activate access to the service by running:

```
cf enable-service-access nfs
```

To limit access to a specific org, use the `-o` flag, followed by the name of the org where you want to activate access. For more information, see [Access Control](#).

5. (Optional) Activate access to the `nfs-legacy` service by running:

```
cf enable-service-access nfs-legacy
```

For details about the differences between the two `nfs` services, see the [NFS Volume Service](#) section of the [Using an External File System \(Volume Services\)](#) topic.

After completing these steps, developers can use the cf CLI to create service instances of the `nfs` service and bind them to their apps.

## NFS security

You can use ASGs and LDAP to secure your NFS server against traffic apps running on TAS for VMs:

- **App Security Groups (ASGs):** Prevent apps from sending traffic directly to your NFS ports. Apps must never need to use NFS ports directly. VMware recommends defining an ASG that blocks direct access to your NFS server IP, especially ports 111 and 2049. For more information on setting up ASGs, see [App Security Groups](#).
- **LDAP:** In addition to ASGs, secures the NFS volume service so that app developers cannot bind to the service using an arbitrary UID. App developers also cannot gain access to sensitive data. With LDAP support activated, app developers must provide credentials for any user they want to bind as.

The Diego Cells running on TAS for VMs must be able to reach your LDAP server on the port you use for connections, which are typically 389 or 636. You cannot limit which Diego Cells have access to your NFS or LDAP servers.

## Activate SMB volume services

In a clean install, SMB volume services are activated by default. In an upgrade, SMB volume services match the setting of the previous deployment.

To activate SMB volume services in TAS for VMs:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **App Containers**.
4. Select the **Allow SMB volume services** check box.
5. Click **Save**.
6. Select **Errands**.
7. Set the **SMB Broker Errand** to **On**.
8. Click **Save**.
9. Return to the Tanzu Operations Manager Installation Dashboard, click **Review Pending Changes**, and click **Apply Changes** to redeploy.
10. Using the cf CLI, activate access to the service by running:

```
cf enable-service-access smb
```

To limit access to a specific org, use the `-o` flag, followed by the name of the org where you want to enable access. For more information, see [Access Control](#).

After you complete these steps, developers can use the cf CLI to create service instances of the `smb` service and bind them to their apps.

## Managing Service Brokers

This page assumes you are using cf CLI v6.16 or later.

In order to run many of the commands, you must be authenticated with VMware Tanzu Application Service for VMs as an admin user or as a space developer.

## Quick start

Given a service broker that has implemented the [Service Broker API](#), two steps are required to make its services available to end users in all orgs or a limited number of orgs by service plan.

1. [Registering a broker](#)
2. [Making plans public](#)

## Registering a broker

Registering a broker causes Cloud Controller to fetch and validate the catalog from your broker, and save the catalog to the Cloud Controller database. The basic auth username and password which are provided when adding a broker are encrypted in Cloud Controller database, and used by the Cloud Controller to authenticate with the broker when making all API calls. Your service broker can validate the username and password sent in every request; otherwise, anyone could curl your broker to delete service instances. When the broker is registered with an URL having the scheme `https`, Cloud Controller makes all calls to the broker over HTTPS.

As of cf-release 229, CC API 2.47.0, Operations Manager supports two types of brokers: *standard brokers* and *space-scoped brokers*. A list of their differences follows:

### Standard Brokers

- Publish service plans to specific orgs or all orgs in the deployment. Can also keep plans unavailable, or *private*.
- Created by admins, with the command `cf create-service-broker`

```
$ cf create-service-broker mybrokername someuser somethingsecure http s://mybroker.example.com
```
- Managed by admins
- Service plans are created private. Before anyone can use them, an admin must explicitly [make them available](#) within an org or across all orgs.

### Space-scoped brokers

- Publish service plans only to users within the space they are created. Plans are unavailable outside of this space.
- Created by space developers using the command `cf create-service-broker` with the `--space-scoped` flag
 

```
$ cf create-service-broker mybrokername someuser somethingsecure http s://mybroker.example.com --space-scoped
```

If a space developer runs `cf create-service-broker` without the `--space-scoped` flag, they receive an error.

- Managed by space developers
- Newly created plans are published to all users in their space.

## Making plans public

After an admin creates a new service plan from a standard broker, no one can use it until the admin explicitly makes it available to users within a specific org or all orgs in the deployment.

See the [Access Control](#) topic for how to make standard broker service plans available to users.

## Multiple brokers, services and plans

Many service brokers can be added to a Operations Manager instance, each offering many services and plans. Keep the following constraints in mind:

- It is not possible to have multiple brokers with the same name.
- Prior to Cloud Foundry API (CAPI) v1.71, the service ID and plan IDs of each service advertised by the broker must be unique across Operations Manager.
- With CAPI v1.71 or later, the service ID and plan IDs of each service advertised by the broker must be unique only within the broker and can overlap ids defined in other brokers.
- GUIDs are recommended for the service ID and plan IDs of each service.



If your deployment uses CAPI v1.71 or later, you can add multiple brokers with the same URL. In this case, the brokers must have different names. CAPI v1.70 and earlier do not support this feature.

See [Possible errors](#) for error messages and what do to when you see them.

## Listing service brokers

```
$ cf service-brokers
Getting service brokers as admin...
OK

Name          URL
my-service-broker https://mybroker.example.com
```

## Updating a broker

Updating a broker is how to ingest changes a broker author has made into Cloud Foundry. Similar to adding a broker, update causes Cloud Controller to fetch the catalog from a broker, validate it, and update the Cloud Controller database with any changes found in the catalog.

Update also provides a means to change the basic auth credentials cloud controller uses to authenticate with a broker, as well as the base URL of the broker's API endpoints.

```
$ cf update-service-broker mybrokername someuser somethingsecure https://mybroker.example.com
```

## Renaming a broker

A service broker can be renamed with the `rename-service-broker` command. This name is used only by the Operations Manager operator to identify brokers, and has no relation to configuration of the broker itself.

```
$ cf rename-service-broker mybrokername mynewbrokername
```

## Removing a broker

When you remove a service broker, all services and plans in the broker's catalog are removed from the Operations Manager Marketplace.

```
$ cf delete-service-broker mybrokername
```

When you attempt to remove a service broker it can fail if there are service instances for any service plan in its catalog. When you are planning to shut down or delete a broker, make sure to remove all service instances first. Failure to do so leaves [orphaned service instances](#) in the Operations Manager database. If a service broker has been shut down without first deleting service instances, you can remove the instances with the CLI, see [Purge a Service](#).

## Purging a service

If a service broker has been shut down or removed without first deleting service instances from Operations Manager, you can be unable to remove the service broker or its services and plans from the Marketplace. In development environments, broker authors often destroy their broker deployments and need a way to clean up the Cloud Controller database.

The following command deletes a service offering, all of its plans, and all associated service instances and bindings from the Cloud Controller database, without making any API calls to a service broker. Once all services for a broker have been purged, the broker can be removed normally.

```
$ cf purge-service-offering service-test
```

Warning: This operation assumes that the service broker responsible for this service offering is no longer available, and all service instances have been deleted, leaving orphan records in Operations Manager's database. All knowledge of the service can be removed from Operations Manager, including service instances and service bindings. No attempt is made to contact the service broker; running this command without destroying the service broker causes orphan service instances. After running this command you might want to run either `delete-service-auth-token` or `delete-service-broker` to complete the cleanup.

Really purge service offering service-test from Operations Manager? y  
OK

## Purging a service instance

The following command deletes a single service instance, its service bindings and its service keys from the Cloud Controller database, without making any API calls to a service broker. This helps in instances when a Service Broker is not conforming to the Service Broker API and not returning a 200 or 410 to requests to delete the service instance.

```
$ cf purge-service-instance mysql-dev
```

WARNING: This operation assumes that the service broker responsible for this service instance is no longer available or is not responding with a 200 or 410, and the service instance has been deleted, leaving orphan records in Cloud Foundry's database. All knowledge of the service instance is removed from Operations Manager, including service bindings and service keys.

```
Really purge service instance mysql-dev from Operations Manager?> y
Purging service mysql-dev...
OK
```

`purge-service-instance` requires cf-release v218 and cf CLI 6.14.0.

When multiple brokers provide two or more service instances with the same name, you must specify the broker by including the `-b BROKER` flag in the `cf purge-service-instance` command.

## Catalog validation behaviors

When Operations Manager fetches a catalog from a broker, and compares the broker's id for services and plans with the `unique_id` values for services and plans in the Cloud Controller database.

Event	Action
The catalog fails to load or validate.	Operations Manager returns a meaningful error that the broker could not be reached or the catalog was not valid.
A service or plan in the broker catalog has an ID that is not present among the <code>unique_id</code> values in the marketplace database.	A new record must be added to the marketplace database.
A service or plan in the marketplace database are found with a <code>unique_id</code> that matches the broker catalog's ID.	The marketplace must update the records to match the broker's catalog.
The database has plans that are not found in the broker catalog, and there are no associated service instances.	The marketplace must remove these plans from the database, and then delete services that do not have associated plans from the database.
The database has plans that are not found in the broker catalog, but there are provisioned instances.	The marketplace must mark the plan inactive and no longer allow it to be provisioned.

## Possible errors

If incorrect basic auth credentials are provided:

```
Server error, status code: 500, error code: 10001, message: Authentication failed for the service broker API.
Verify that the username and password are correct:
https://github-broker.al-app.example.com/v2/catalog
```

If you receive the following errors, check your broker logs. You might have an internal error.

```
Server error, status code: 500, error code: 10001, message:
The service broker response was not understood

Server error, status code: 500, error code: 10001, message:
The service broker API returned an error from
https://github-broker.al-app.example.com/v2/catalog: 404 Not Found

Server error, status code: 500, error code: 10001, message:
The service broker API returned an error from
```

```
https://github-broker.primo.example.com/v2/catalog: 500 Internal Server Error
```

If your broker's catalog of services and plans violates validation of presence, uniqueness, and type, you can receive meaningful errors.

```
Server error, status code: 502, error code: 270012, message: Service broker catalog is invalid:
Service service-name-1
  service id must be unique
  service description is required
  service "bindable" field must be a boolean, but has value "true"
Plan plan-name-1
  plan metadata must be a hash, but has value [{"bullets":>["bullet1", "bullet2"]}]
```

## Managing access to Service Plans

All new service plans from standard brokers are private by default. When you add a new broker, or when you add a new plan to an existing broker's catalog, service plans do not immediately become available. This is an admin control which service plans are available to you, and manage limited service availability.

Space scoped brokers are registered to a specific space, and all users within that space can access the broker's service plans. With space-scoped brokers, service visibility is not managed separately.

## Prerequisites

- CLI v6.4.0
- Cloud Controller API v2.9.0 (cf-release v179)
- Admin user access; the following commands can be run only by an admin user

## Service Plan access

The `service-access` CLI command allows an admin to see the current access control setting for every service plan in the marketplace, across all service brokers.

```
$ cf service-access
getting service access as admin...
broker: elasticsearch-broker
  service      plan      access      orgs
  elasticsearch  standard  limited

broker: p-mysql
  service      plan      access      orgs
  p-mysql     100mb-dev  all
```

The `access` column shows values `all`, `limited`, or `none`, defined as follows:

- `all` - The service plan is available to all users, or *public*.

- `none` - No one can use the service plan; it is *private*.
- `limited` - The plan is available only to users within the orgs listed.

The `-b`, `-e`, and `-o` flags let you filter by broker, service, and org.

```
$ cf help service-access
NAME:
  service-access - List service access settings

USAGE:
  cf service-access [-b BROKER] [-e SERVICE] [-o ORG]

OPTIONS:
  -b      access for plans of a particular broker
  -e      access for plans of a particular service offering
  -o      plans accessible by a particular org
```

## Enabling access to Service Plans

Admins use the `cf enable-service-access` command to give users access to service plans. The command grants access at the org level or across all orgs.

When an org has access to a plan, its users see the plan in the services marketplace (`cf marketplace`) and its Space Developer users can provision instances of the plan in their spaces.

### Enabling access to a subset of users

The `-p` and `-o` flags to `cf enable-service-access` let the admin limit user access to specific service plans or orgs as follows:

- `-p PLAN` grants all users access to one service plan (access:`all`)
- `-o ORG` grants users in a specified org access to all plans (access: `limited`)
- `-p PLAN -o ORG` grants users in one org access to one plan (access: `limited`)

For example, the following command grants the org dev-user-org access to the p-mysql service.

```
$ cf enable-service-access p-mysql -o dev-user-org
Enabling access to all plans of service p-mysql for the org dev-user-org as a
dmin...
OK

$ cf service-access
getting service access as admin...
broker: p-mysql
  service   plan       access     orgs
    p-mysql          dev-user-org
```

Run `cf help enable-service-access` to review these options from the command line.

Running `cf enable-service-access SERVICE-NAME` without any flags lets all users access every plan carried by the service. For example, the following command grants all-user access to all `p-mysql` service plans:

```
$ cf enable-service-access p-mysql
Enabling access to all plans of service p-mysql for all orgs as admin...
OK

$ cf service-access
getting service access as admin...
broker: p-mysql
  service   plan       access   orgs
  p-mysql   100mb-dev  all
```

When multiple brokers provide two or more services with the same name, you must specify the broker by including the `-b BROKER` flag in the `cf enable-service-access` command.

## Deactivating access to Service Plans

Admins use the `cf disable-service-access SERVICE-NAME` command to deactivate user access to service plans. The command denies access at the org level or across all orgs.

### Deactivating access to all plans for all users

When you run `cf disable-service-access SERVICE-NAME` without any flags, it deactivates all user access to all plans carried by the service. For example, the following command denies any user access to all `p-mysql` service plans:

```
$ cf disable-service-access p-mysql
Disabling access to all plans of service p-mysql for all orgs as admin...
OK

$ cf service-access
getting service access as admin...
broker: p-mysql
  service   plan       access   orgs
  p-mysql   100mb-dev  none
```

### Deactivating access for specific orgs or plans

The `-p` and `-o` flags to `cf disable-service-access` allow the admin to deny access to specific service plans or orgs as follows:

- `-p PLAN` Deactivates user access to one service plan.
- `-o ORG` Deactivates access to all plans for users in a specified org.
- `-p PLAN -o ORG` Prevents users in one org from accessing one plan.

Run `cf help disable-service-access` to review these options from the command line.

When multiple brokers provide two or more services with the same name, you must specify the broker by including the `-b BROKER` flag in the `cf disable-service-access` command.

## Limitations

- You cannot deactivate access to a service plan for an org if the plan is currently available to all orgs. You must deactivate access for all orgs and activate access for a particular org.

## Dashboard Single Sign-on

Single sign-on (SSO) allows VMware Tanzu Application Service for VMs (TAS for VMs) you to authenticate with third party service dashboards using your TAS for VMs credentials. Service dashboards are web interfaces which allow you to interact with some or all of the features the service offers. SSO provides a streamlined experience that limits repeated logins and multiple accounts across managed services. Your credentials are never directly transmitted to the service because the OAuth protocol handles authentication.

Dashboard SSO was introduced in [cf-release v169](#) so this or a newer version is required to support the feature.

## Enabling SSO

To activate the SSO feature, Cloud Controller requires a UAA client with sufficient permissions to create and delete clients for the service brokers that request them.

You can configure the client by including the following snippet in the cf-release manifest:

```
properties:
  uaa:
    clients:
      cc-service-dashboards:
        secret: cc-broker-secret
        scope: openid,cloud_controller_service_permissions.read
        authorities: clients.read,clients.write,clients.admin
        authorized-grant-types: authorization_code,client_credentials
```

When this client is not present in the cf-release manifest, Cloud Controller cannot manage UAA clients and you receive a warning when creating or updating service brokers that advertise the `dashboard_client` properties.

## Service Broker responsibilities

### Registering the dashboard client

1. A service broker must include the `dashboard_client` line in the JSON response from its [catalog endpoint](#) for each service that implements this feature. A valid response appears:

```
{
  "services": [
    {
      "id": "44b26033-1f54-4087-b7bc-da9652c2a539",
      ...
      "dashboard_client": {
```

```

        "id": "p-mysql-client",
        "secret": "p-mysql-secret",
        "redirect_uri": "http://p-mysql.example.com"
    }
}
]
}

```

The `dashboard_client` line is a hash containing three lines:

- `id` is the unique identifier for the OAuth client that creates your service dashboard on the token server (UAA), and is used by your dashboard to authenticate with the token server (UAA). If the client id is already taken, TAS for VMs returns an error when registering or updating the broker.
  - `secret` is the shared secret your dashboard uses to authenticate with the token server (UAA).
  - `redirect_uri` is used by the token server as an additional security precaution. UAA does not provide a token if the callback URL declared by the service dashboard does not match the domain name in `redirect_uri`. The token server matches on the domain name. Any paths also match. For example, a service dashboard requesting a token and declaring a callback URL of `http://p-mysql.example.com/manage/auth` is approved if `redirect_uri` for its client is `http://p-mysql.example.com/`.
2. When a service broker advertises the `dashboard_client` property for any of its services is [added or updated](#), Cloud Controller creates or update UAA clients as necessary. This client is used by the service dashboard to authenticate users.

## Dashboard URL

A service broker must return a URL for `dashboard_url` in response to a [provision request](#). Cloud Controller clients exposes this URL to users. `dashboard_url` can be found in the response from Cloud Controller to create a service instance, enumerate service instances, space summary, and other endpoints.

You can go to the service dashboard at the URL provided by `dashboard_url`, initiating the OAuth login flow.

## Service dashboard responsibilities

### OAuth flow

When you go to the URL from `dashboard_url`, the service dashboard initiates the OAuth login flow. A summary of the flow can be found in [section 1.2 of the OAuth RFC](#). OAuth expects the presence of an [Authorization Endpoint](#) and a [Token Endpoint](#). In TAS for VMs these endpoints are provided by the UAA. Clients can discover the location of UAA from Cloud Controller's info endpoint; in the response the location can be found in the `token_endpoint` field.

```

$ curl api.example.com/info
{
  "name": "vcap",
  "build": "2222",
  "support": "http://support.example.com",
  "version": 2,
  "description": "Cloud Foundry sponsored by Example Company",
  "authorization_endpoint": "https://login.example.com",
  "token_endpoint": "https://uaa.example.com",
  "allow_debug": true
}

```

To activate service dashboards to support SSO for service instances created from different TAS for VMs instances, the /v2/info url is sent to service brokers in the `X-Api-Info-Location` header of every API call.

A service dashboard can discover this URL from the broker, which activates the dashboard to contact the appropriate UAA for a particular service instance. Although the Cloud Foundry API (CAPI) V2 is now deprecated, the Cloud Controller still communicates its /v2/info URL through this header. /v2/info is the sole CAPI V2 endpoint that continues to be served even where a Cloud Controller has been configured, through the CAPI bosh release, to deactivate the V2 API

A service dashboard must implement the OAuth Authorization Code Grant type [UAAC documentation](#), [RFC documentation](#).

- When you visit the service dashboard at the value of `dashboard_url`, the dashboard redirects you to a browser for the Authorization Endpoint and includes `client_id`, a `redirect_uri` (callback URL with domain matching the value of `dashboard_client.redirect_uri`), and a list of requested scopes.

Scopes are permissions that are included in the token for a dashboard client that are received from UAA, and which Cloud Controller uses to enforce access. A client must request the minimum scopes it requires. The minimum scopes required for this workflow are:

`cloud_controller_service_permissions.read` and `openid`.

For an explanation of the scopes available to dashboard clients, see [On Scopes](#).

- You are authenticated by UAA and redirected to the Login Server, where you approve or deny the scopes requested by the service dashboard. You are presented with a description for permissions that represent each scope. After authentication, your browser is redirected back to the Authorization endpoint on UAA with an authentication cookie for the UAA.
- Assuming you grant access, UAA redirects your browser back to the value of `redirect_uri` that the dashboard provided in the request for the Authorization Endpoint. The `Location` header in the response includes an authorization code:

```
HTTP/1.1 302 Found
Location: https://p-mysql.example.com/manage/auth?code=F45jH
```

- The dashboard UI then requests an access token from the Token Endpoint by including the authorization code that you received in the previous step. When you make the request, the dashboard must authenticate with UAA by passing the client `id` and `secret` lines in a basic auth header. UAA verifies that the client id matches the client that issued the code. The dashboard also includes the `redirect_uri` used to obtain the authorization code for verification.
- UAA authenticates the dashboard client, validates the authorization code, and makes sure that the redirect URI that was received matches the URI used to redirect the client. If valid, UAA responds back with an access token and a refresh token.

## Checking user permissions

UAAC is responsible for your authentication and provides the service with an access token with the requested permissions. However, after you have been logged in, it is the responsibility of the service dashboard to verify that you make the request to manage an instance and have access to that service instance.

The service uses a GET to the `/v3/service_instances/:guid/permissions` endpoint on the Cloud Controller. The request must include a token for an authenticated user and the service instance GUID. The token is the same one obtained from the UAA in response to a request to the Token Endpoint described earlier.

### Request example

```
curl -H 'Content-Type: application/json' \
  -H 'Authorization: bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJ1c2VyX2lkIjoid' \
\ http://api.cloudfoundry.com/v3/service_instances/44b26033-1f54-4087-b7bc-da9652c2a539/permissions
```

### Response

```
{
  "manage": true,
  "read": true
}
```

The response includes the following strings which indicate the your various permissions for a given service instance:

- `manage`: if `true`, you have sufficient permissions to make changes and update the service instance. `false` indicates insufficient permissions.
- `read`: if `true`, you have permission to access read-only diagnostic and monitoring information for a given service instance. For example, permission to view a read-only dashboard. `false` indicates insufficient permissions.

Since administrators might change the permissions of users at any time, the service checks this endpoint whenever a user uses the SSO flow to access the service UI.

## Scopes

With scopes you can specify exactly what type of access you need. Scopes limit access for OAuth tokens. They do not grant any additional permission beyond what you already have.

### Minimum scopes

The following scopes are necessary to implement the integration. Most dashboards might not need more permissions than to have the scopes activated.

Scope	Permissions
<code>openid</code>	Allows access to basic data, for example, email addresses
<code>cloud_controller_service_permissions.read</code>	Allows access to the CC endpoint that specifies whether you can manage a given service instance

### Additional scopes

Dashboards with extended capabilities might need to request the following additional scopes:

Scope	Permissions
<code>cloud_controller.read</code>	Allows read access to all resources you are authorized to read
<code>cloud_controller.write</code>	Allows write access to all resources you are authorized to update / create / delete

## Reference implementation

The [MySQL Service Broker](#) is an example of a broker that implements a SSO dashboard.

The login flow is implemented using the [OmniAuth library](#) and a custom UAA OmniAuth Strategy.

See the [OmniAuth wiki page](#) for instructions on how to create your own strategy.

The UAA OmniAuth strategy is used to get an authorization code.

For more information on authorization codes, see [this section](#) of the UAA documentation.

You are redirected back to the service (as specified by the `callback_path` option or the default `auth/cloudfoundry/callback` path) with the authorization code. Before the application action is dispatched, the OmniAuth strategy uses the authorization code to [get a token](#) and uses the token to request information from UAA to fill the `omniauth.auth` environment variable. When OmniAuth returns control to the application, the `omniauth.auth` environment variable hash is filled with the token and user information obtained from UAA.

For more information, see [Auth Controller](#).

## Restrictions

- UAA clients are scoped to services. There must be a `dashboard_client` entry for each service that uses SSO integration.
- Each `dashboard_client_id` must be unique across the TAS for VMs deployment.

## Resources

- [OAuth](#)
- [Example broker with SSO implementation](#)
- [Cloud Controller API docs](#)
- [User Account and Authentication \(UAA\) Service APIs](#)
- [MySQL Service Broker / example-broker](#)

## Using feature flags with TAS for VMs

With TAS for VMs, you can set feature flags by using the cf CLI to activate or deactivate the features available to users.

## View and edit feature flags

To perform the following procedures, you must be logged in to your deployment as an admin using the Cloud Foundry Command Line Interface (cf CLI).

To view and edit feature flags:

1. Use the `cf feature-flags` command to list the feature flags:

```
$ cf feature-flags
```

Features	State
user_org_creation	disabled
private_domain_creation	enabled
app_bits_upload	enabled
app_scaling	enabled
route_creation	enabled
service_instance_creation	enabled
diego_docker	disabled
set_roles_by_username	enabled
unset_roles_by_username	enabled
task_creation	enabled
env_var_visibility	enabled
spaceScoped_private_broker_creation	enabled
space_developer_env_var_visibility	enabled
service_instance_sharing	disabled
hide_marketplace_from_unauthenticated_users	disabled
resource_matching	enabled

For descriptions of the features enabled by each feature flag, see [Feature Flags](#flags).

2. To view the status of a feature flag, run:

```
cf feature-flag FEATURE-FLAG-NAME
```

Where `FEATURE-FLAG-NAME` is the name of the feature flag you want to view.

3. To enable a feature flag, run:

```
cf enable-feature-flag FEATURE-FLAG-NAME
```

Where `FEATURE-FLAG-NAME` is the name of the feature flag you want to activate.

4. To deactivate a feature flag, run:

```
cf disable-feature-flag FEATURE-FLAG-NAME
```

Where `FEATURE-FLAG-NAME` is the name of the feature flag you want to deactivate.

## Feature flags

Only admins can set feature flags. All flags are activated by default except `user_org_creation` and `diego_docker`. When deactivated, these features are only available to admins.

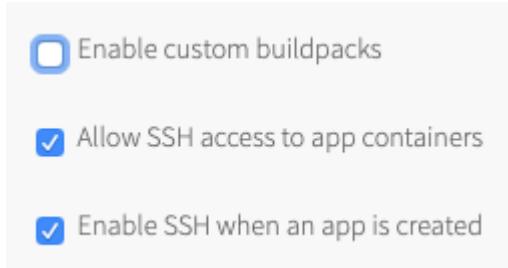
The following list provides descriptions of the features enabled or deactivate by each flag, and the minimum Cloud Controller API (CC API) version necessary to use the feature. To determine your Cloud Controller API version, see [Identifying the API Endpoint for Your TAS for VMs Instance](#).

- `user_org_creation`: Any user can create an org. If enabled, this flag activates the **Create a New Org** link in the dropdown of the left navigation menu in Apps Manager. Minimum CC API version: 2.12.
- `private_domain_creation`: An Org Manager can create private domains for that org. Minimum CC API version: 2.12.
- `app_bits_upload`: Space Developers can upload app bits. Minimum CC API version: 2.12.
- `app_scaling`: Space Developers can perform scaling operations such as changing memory, disk, or instances. Minimum CC API version: 2.12.
- `route_creation`: Space Developers can create routes in a space. Minimum CC API version: 2.12.
- `route_sharing`: Space Developers can share routes between two spaces (including across orgs) in which they have the Space Developer role. When deactivated, Space Developers cannot share routes between two spaces. Minimum CC API version: 3.117.
- `service_instance_creation`: Space Developers can create service instances in a space. Minimum CC API version: 2.12.
- `diego_docker`: Space Developers can push Docker apps. Minimum CC API version 2.33.
- `set_roles_by_username`: Org Managers and Space Managers can add roles by username. Minimum CC API version: 2.37.
- `unset_roles_by_username`: Org Managers and Space Managers can remove roles by username. Minimum CC API version: 2.37.
- `task_creation`: Space Developers can create tasks on their app. Minimum CC API version: 2.47.
- `env_var_visibility`: Admins can view environment variables. Minimum CC API version: 2.58.
- `space_scoped_private_broker_creation`: Space Developers can create space-scoped private service brokers. Minimum CC API version: 2.58.
- `space_developer_env_var_visibility`: Space Developers can view their v2 environment variables. Space Developers and Space Supporters can view their v3 environment variables. Minimum CC API version: 2.58.
- `service_instance_sharing`: Space Developers can share service instances between two spaces (across orgs) in which they have the Space Developer role.
- `hide_marketplace_from_unauthenticated_users`: Do not allow unauthenticated users to see the service offerings available in the marketplace.
- `resource_matching`: Allow the package upload endpoint to cache uploaded packages for resource matching. When deactivated, the resource match endpoint always returns an empty array of matches. Minimum CC API version: 3.77.

For more information about feature flag commands, see [Feature Flags](#) in the Cloud Foundry API documentation.

## Deactivate custom buildpacks

You can deactivate custom buildpacks using the TAS for VMs tile. In the **App Containers** pane, deselect the **Enable custom buildpacks** check box, as shown in the following image.



By default, the `cf` CLI gives developers the option of using a custom buildpack when they deploy apps to TAS for VMs. To do so, they use the `-b` option to provide a custom buildpack URL with the `cf push` command. Deselecting the **Enable custom buildpacks** check box prevents the `-b` option from being used with external buildpack URLs.

For more information about custom buildpacks, see [Creating custom buildpacks](#).

## Managing custom buildpacks in TAS for VMs

You can manage additional buildpacks in TAS for VMs by using the Cloud Foundry Command Line Interface tool (`cf` CLI).

If your app uses a language or framework that the VMware Tanzu Application Service for VMs (TAS for VMs) system buildpacks do not support, you can take one of the following actions:

- Write your own buildpack. For more information, see [Creating custom buildpacks](#).
- Customize an existing buildpack.
- Use a [Cloud Foundry Community Buildpack](#).
- Use a [Heroku Third-Party Buildpack](#).

## Add a buildpack

You must be a TAS for VMs admin user to run the commands discussed in this section.

To add a buildpack:

1. Run:

```
cf create-buildpack BUILDPACK PATH POSITION
```

Where:

- `BUILDPACK` specifies the buildpack name.
- `PATH` specifies the location of the buildpack. `PATH` can point to a ZIP file, the URL of a ZIP file, or a local directory.
- `POSITION` specifies where to place the buildpack in the detection priority list.

For more information, enter `cf help create-buildpack`.

2. To confirm that you have successfully added a buildpack, run:

```
cf buildpacks
```

## Rename a buildpack

To rename a buildpack:

Using cf CLI v7+ run:

```
cf update-buildpack --rename BUILDPACK-NAME NEW-BUILDPACK-NAME
```

Where:

- `BUILDPACK-NAME` is the original buildpack name.
- `NEW-BUILDPACK-NAME` is the new buildpack name.

For more information about renaming buildpacks, enter `cf help rename-buildpack`.

## Update a buildpack

To update a buildpack, run:

```
cf update-buildpack BUILDPACK [-p PATH] [-i POSITION] [-s STACK] [--enable|--disable]
[--lock|--unlock] [--rename NEW_NAME]
```

Where:

- `BUILDPACK` is the buildpack name.
- `PATH` is the location of the buildpack.
- `POSITION` is where the buildpack is in the detection priority list.
- `STACK` is the stack that the buildpack uses.

If you are using cf CLI v6, use the `cf rename-buildpack` command instead of the `-rename` flag.

For more information about updating buildpacks, enter `cf help update-buildpack`.

## Delete a buildpack

To delete a buildpack, run:

```
cf delete-buildpack BUILDPACK [-s STACK] [-f]
```

Where:

- `BUILDPACK` is the buildpack name.
- `STACK` is the stack that the buildpack uses.

For more information about deleting buildpacks, enter `cf help delete-buildpack`.

## Lock and unlock a buildpack

Every new version of Operations Manager ships with an updated buildpack. By default, your deployment applies to the most recent buildpack when you upgrade. In some cases, however, you might want to preserve an existing buildpack, rather than upgrade to the latest version. For example, if an app you deploy depends on a specific component in Buildpack A that is not available in Buildpack B, you might want to continue using Buildpack A.

The `-lock` flag lets you continue to use your existing buildpack even after you upgrade. Locked buildpacks are not updated when Operations Manager updates. You must manually unlock them to update them.

If you elect to use the `-unlock` flag, your deployment applies to the most recent buildpack when you upgrade Operations Manager.

```
cf update-buildpack BUILDPACK [-p PATH] [-i POSITION] [-s STACK] [--enable|--disable]
[--lock|--unlock] [--rename NEW_NAME]
```

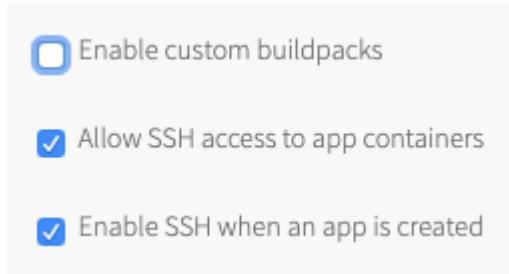


If you are using cf CLI v6, the `--rename` flag is not supported. Use the `cf rename-buildpack` instead.

This feature is also available through the API. See the `locked` flag under [Update a Buildpack](#) in the [Cloud Foundry API](#) documentation.

## Deactivate custom buildpacks

You can deactivate custom buildpacks using the TAS for VMs tile. In the **App Containers** pane, deselect the **Enable custom buildpacks** check box, as shown in the following image.



By default, the cf CLI gives developers the option of using a custom buildpack when they deploy apps to TAS for VMs. To do so, they use the `-b` option to provide a custom buildpack URL with the `cf push` command. Deselecting the **Enable custom buildpacks** check box prevents the `-b` option from being used with external buildpack URLs.

For more information about custom buildpacks, see [Creating custom buildpacks](#).

## Supporting WebSockets in TAS for VMs

In this topic, learn how TAS for VMs uses WebSockets, why use WebSockets in your apps, and how to configure your load balancer to support WebSockets.

You can use a load balancer to distribute incoming traffic across VMware Tanzu Application Service for VMs (TAS for VMs) router instances and configure your load balancer for WebSockets. Otherwise, the Loggregator system cannot stream app logs to developers, or app event data and component metrics to third-party aggregation services. Additionally, developers cannot use WebSockets in their apps.

## WebSocket overview

The WebSocket protocol provides full duplex communication over a single TCP connection. Apps use WebSockets to perform real time data exchange between a client and a server more efficiently than HTTP.

TAS for VMs uses WebSockets for the following metrics and logging purposes:

1. To stream all app event data and component metrics from the Doppler server instances to the Traffic Controller.
2. To stream app logs from the Traffic Controller to developers using the Cloud Foundry Command Line Interface (cf CLI) or [Getting started with Apps Manager](#).
3. To stream all app event data and component metrics from the Traffic Controller over the Firehose endpoint to external apps or services.

For more information about these Loggregator components, see [Loggregator Architecture](#).

## Configuring your load balancer for WebSockets

To form a WebSocket connection, the client sends an HTTP request that contains an `Upgrade` header and other headers required to complete the WebSocket handshake. You must configure your load balancer to not upgrade the HTTP request, but rather to pass the `Upgrade` header through to the TAS for VMs router. The procedures required to configure your load balancer depends on your IaaS and load balancer. The following list includes several possible approaches:

- Some load balancers can recognize the `Upgrade` header and pass these requests through to the TAS for VMs router without returning the WebSocket handshake response. This might or might not be default behavior, and might require additional configuration.
- Some load balancers do not support passing WebSocket handshake requests containing the `Upgrade` header to the TAS for VMs router. For instance, the Amazon Web Services (AWS) Elastic Load Balancer (ELB) does not support this behavior. In this scenario, you must configure your load balancer to forward TCP traffic to your TAS for VMs router to support WebSockets. If your load balancer does not support TCP pass-through of WebSocket requests on the same port as other HTTP requests, you can do one of the following:
  - Configure your load balancer to listen on a non-standard port (the built-in TAS for VMs load balancer listens on 8443 by default for this purpose), and forward requests for this port in TCP mode. App clients must make WebSockets upgrade requests to this port. If you choose this strategy, you must follow the steps in [Set Your Loggregator Port](#).
  - If a non-standard port is not acceptable, add a load balancer that handles WebSocket traffic (or another IP on an existing load balancer) and configure it to listen on standard ports 80 and 443 in TCP mode. Configure DNS with a new hostname, such as `ws.cf.example.com`, to be used for WebSockets. This hostname should resolve to the new load balancer interface.

Regardless of your IaaS and configuration, you must configure your load balancer to send the X-Forwarded-For and X-Forwarded-Proto headers for non-WebSocket HTTP requests on ports 80 and 443. For more information, see [Securing Traffic into TAS for VMs](#).

Gorouter rejects WebSockets requests for routes that are bound to route services. These requests return a 503 error and a `X-Cf-Routererror route_service_unsupported` header.



Gorouter does not support WebSockets over HTTP/2. For more information, see [RFC 8441](#). Configure your load balancer to always send WebSocket requests to Gorouter over HTTP/1.1. For more information, see [Configuring HTTP/2 Support](#).

## Setting your Loggregator port

By default, TAS for VMs assigns port 443 for TCP/WebSocket communications. If you have configured your load balancer to use a port other than 443 for TCP/WebSocket traffic, you must edit the **Loggregator port** field in the **Networking** pane of the TAS for VMs tile.

HTTP headers to log	<input type="text"/>
Maximum request header size (min: 1, max: 1024) *	<input type="text" value="48"/>
Loggregator port	<input type="text" value="443"/>

## Distributed tracing

Cloud Foundry provides support for distributed tracing, enabling transactions to be monitored and analyzed across multiple Cloud Foundry components. For each transaction initiated in the GoRouter, a new trace context is generated and then propagated to all participating systems.

Each participating system adds a unique identifier to logs, allowing you to trace logs and debug errors specific to that transaction. Distributed tracing is particularly beneficial when used with log aggregation tools like Splunk.

## Unique trace identification

For every request in Cloud Foundry, GoRouter generates a unique `X-Vcap-Request-Id` header. `X-Vcap-Request-Id` is a v4 UUID according to [RFC 4122](#).

If Zipkin is enabled, see [Enabling Zipkin tracing in Cloud Foundry](#).

GoRouter generates B3 headers for each request unless they were provided by the client:

- `X-B3-Traceid` - 128-bit in length and indicates the overall ID of the trace. Every span in a trace shares this ID. The `X-B3-TraceId` header is encoded as 32 lower-hex characters.

- `X-B3-Spanid` - 64-bit in length and indicates the position of the current operation in the trace tree. The `X-B3-SpanId` header is encoded as 16 lower-hex characters.
- `B3` - a combination of `X-B3-Traceid` and `X-B3-Spanid` headers in the format: `{TraceId}-{SpanId}`

If W3C is enabled through the `router.tracing.enable_w3c` deployment manifest property, GoRouter generates W3C headers for each request unless they were provided by the client. W3C headers are generated according to the [W3C headers format](#):

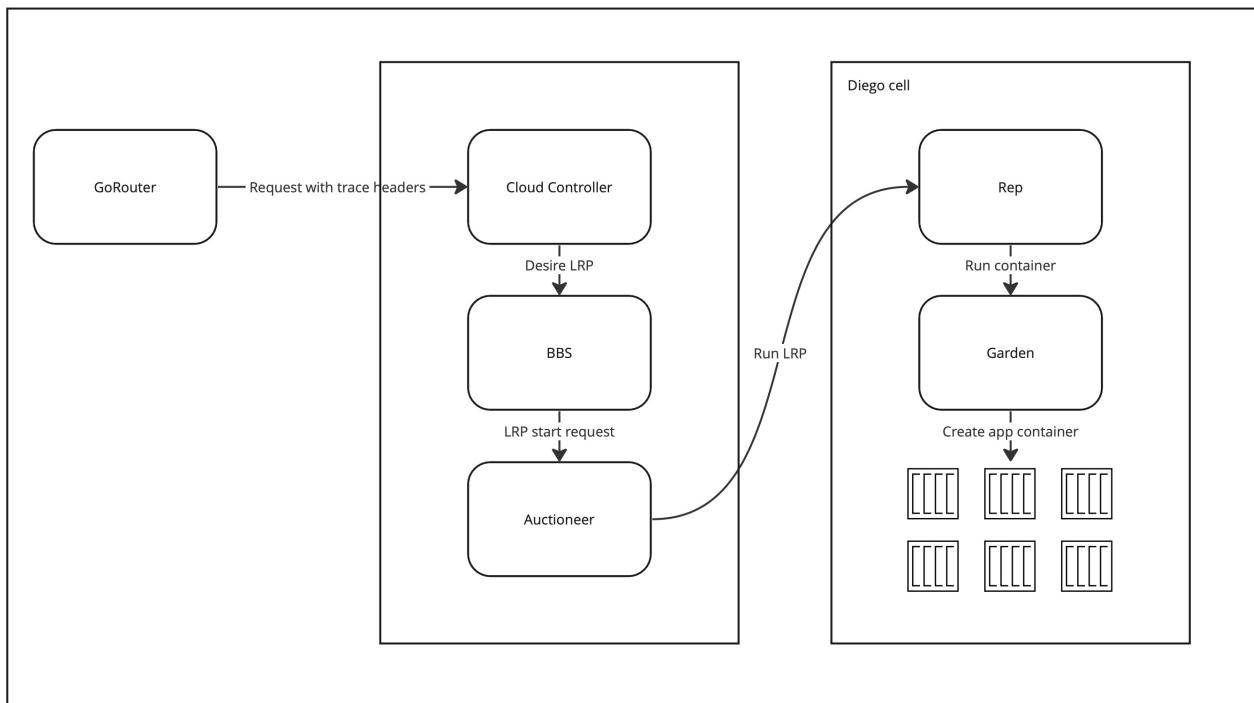
- `traceparent` - consists of 4 fields in the format: `{version-format}-{trace-id}-{parent-id}-{trace-flags}`
- `tracestate` - is generated from `router.tracing.w3c_tenant_id` deployment property and `parent-id` used in the transparent header: `{w3c_tenant_id}={parent-id}`

If B3 headers are provided and they are in a proper v4 UUID format, GoRouter uses them for `X-Vcap-Request-Id` and W3C headers. If they are not provided, GoRouter generates v4 UUID and use it for B3 headers, `X-Vcap-Request-Id` and W3C headers.

## Using trace identification to analyze a specific Cloud Foundry request

In the following example, a request is made to Cloud Foundry to scale an application. This request is handled by several Cloud Foundry components:

1. The request is initially received by GoRouter. GoRouter generates unique trace headers for this request. It then forwards this request with the trace headers to the Cloud Controller.
2. Cloud Controller updates the LRP (Long Running Process) for the application, reflecting the new number of instances. It subsequently sends the LRP request with the appended trace headers to BBS.
3. BBS generates a new request with the trace headers to Auctioneer to schedule a new application instance.
4. Auctioneer selects a Diego Cell that has enough resources to run the application instance. It then sends a request with the trace headers to Rep on that Diego Cell, instructing it to run this new application instance.
5. Finally, Rep generates a request to Garden. This request with the same trace information, instructs Garden to create a container where application processes run.



Each component in this transaction:

- Retains the original request's `trace-id` and forwards it in all downstream requests.
- Generates a unique span-id for each request, which remains exclusive to that particular component.
- Both the `trace-id` and `span-id` are recorded in logs related to that request handling.

This transaction is characterized by a single trace-id that identifies it across all hops, while each individual hop is marked by its own unique span-id.

The `CF_TRACE` environment variable is used to get the generated B3 trace headers.

```
CF_TRACE=true cf scale myapp -i 2
```

The output contains a sequence of requests and responses from Cloud Foundry. Initially, the CLI retrieves the application GUID, followed by an API request to scale the application. The response to this request includes B3 headers, which are generated by the GoRouter.

```

Scaling app myapp in org myorg / space myspace as admin...

REQUEST:
POST /v3/apps/8e0f1501-ba1f-4efe-af90-b61f2e5a1384/processes/web/actions/scale
...
{
  "instances": 2
}

RESPONSE:
HTTP/1.1 202 Accepted
...
X-B3-Spanid: 67bde5d7dcd81f84
X-B3-Traceid: 0c2cc9583f004a4167bde5d7dcd81f84
...

```

You can tell the GoRouter to use user-provided B3 headers. For example:

```
curl -H "X-B3-Traceid: 8c436ec437e545227fe76a3eba99ca21" -H "X-B3-Spanid: 7fe76a3eb  
a99ca21" -d '{"instances" : 3}' /v3/apps/8e0f1501-bal-f-4efe-af90-b61f2e5a1384/processes/web/actions/scale
```

You must set both X-B3-Traceid and X-B3-Spanid

The `X-B3-Traceid` can be used to filter logs in aggregation tools to see how this request was handled by the GoRouter, Cloud Controller, BBS, Rep, Auctioneer and how a container for a new application instance was created in Garden.

## Analyzing Cloud Foundry CLI command requests

As of the Cloud Foundry CLI version 8.12.0 and later, the CLI client automatically sets B3 headers. It will generate a single X-B3-Traceid for all API calls originating per command and generate new X-B3-Spanid per API call. Users can manually set the X-B3-Traceid header by setting the `CF_B3_TRACE_ID` environment variable.

## Enabling W3C tracing in TAS for VMs

You can use W3C tracing to troubleshoot failures or latency issues in your apps. You can trace requests and responses across distributed systems. For more information, see [w3c.org](http://w3c.org).

W3C tracing is disabled by default in VMware Tanzu Application Service for VMs (TAS for VMs). To activate this feature:

1. Go to Tanzu Operations Manager Installation Dashboard.
  2. Click the TAS for VMs tile.
  3. Select **Networking**.
  4. Select the **Add W3C tracing headers** check box.
  5. Optionally, enter tenant ID name used in `traceparent` header in **W3C tracing tenant ID** field.
  6. Click **Save**.

For more information about how the Gorouter works with HTTP headers and W3C tracing, see [HTTP headers for W3C tracing in \*HTTP Routing\*](#).

To trace app requests and responses in VMware Tanzu Application Service for VMs (TAS for VMs), apps must also log W3C headers.

After adding W3C HTTP headers to app logs, developers can use `cf logs myapp` to correlate the trace and span IDs logged by the Gorouter with the trace IDs logged by their app. To correlate trace IDs for a request through multiple apps, each app must forward appropriate values for the headers with requests to other apps.

## Enabling Zipkin tracing in TAS for VMs

You can use Zipkin tracing to troubleshoot failures or latency issues in your apps. You can trace requests and responses across distributed systems. For more information, see [Zipkin.io](#).

Zipkin tracing is enabled by default in VMware Tanzu Application Service for VMs (TAS for VMs). To deactivate this feature:

1. Go to Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Networking**.
4. Deselect the **Enable Zipkin tracing headers on the Gorouter** check box.
5. Click **Save**.

For more information about how the Gorouter works with HTTP headers and Zipkin tracing, see the [HTTP Headers](#) section of the *HTTP Routing* topic.

To trace app requests and responses in VMware Tanzu Application Service for VMs (TAS for VMs), apps must also log Zipkin headers.

After adding Zipkin HTTP headers to app logs, developers can use `cf logs myapp` to correlate the trace and span IDs logged by the Gorouter with the trace IDs logged by their app. To correlate trace IDs for a request through multiple apps, each app must forward appropriate values for the headers with requests to other apps.

## Managing internal MySQL

In this section:

- [Monitoring the health of your MySQL via the MySQL Proxy](#)
- [Scaling your internal MySQL](#)
- [Running mysql-diag](#)
- [Recovering from MySQL cluster downtime](#)

## Using the MySQL proxy to monitor MySQL health

Here you will learn how to use the MySQL proxy to monitor the health of your MySQL instance.

If you cannot write or connect to your app, you can verify the health status of your MySQL virtual machines. You can observe the health status of MySQL VMs through a proxy using the Switchboard

dashboard or API endpoint. You can also view the number of client connections routed through a proxy to each VM.

VMware Tanzu Operations Manager uses a proxy to send client connections to the healthy MySQL database cluster nodes in a highly available cluster plan. Using a proxy gracefully handles failure of nodes, enabling fast failover to other nodes within the cluster. When a node becomes unhealthy, the proxy closes all connections to the unhealthy node and re-routes all subsequent connections to a healthy node.

The proxy used in TAS for VMs is Switchboard. Switchboard was developed to replace HAProxy as the proxy tier for the HA cluster for MySQL databases in TAS for VMs.

Switchboard offers the following features:

- **MySQL Server Access**

MySQL clients communicate with nodes through this network port. These connections are automatically passed through to the nodes.

- **Switchboard and API**

Operators can connect to Switchboard to view the state of the nodes.

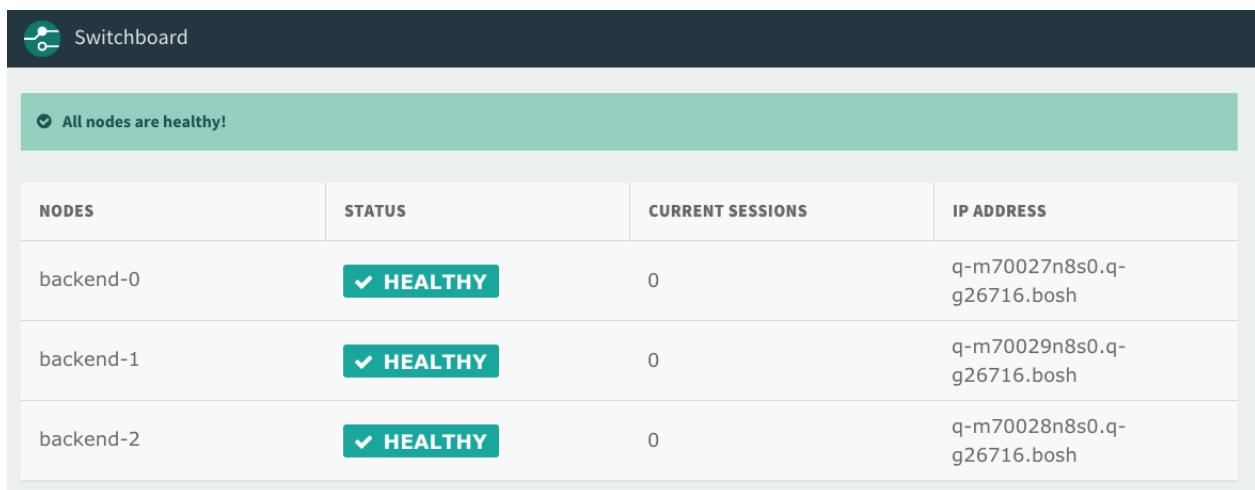
## Node health

Before routing traffic, the proxy queries an HTTP health check process running on the node. This health check can return as either healthy or unhealthy, or the node can be unresponsive.

### Healthy nodes

If the health check process returns HTTP status code [200](#), the proxy includes the node in its pool of healthy nodes.

When a new or resurrected nodes rejoin the cluster, the proxy continues to route all connections to the active node. In the case of failover, the proxy considers all healthy nodes as candidates for new connections. The Switchboard shows all nodes with the **Healthy** status.



The screenshot shows the Switchboard interface with a dark header bar containing a gear icon and the word "Switchboard". Below it is a green banner with the text "All nodes are healthy!". The main content area is a table with four columns: "NODES", "STATUS", "CURRENT SESSIONS", and "IP ADDRESS". There are three rows, each representing a node:

NODES	STATUS	CURRENT SESSIONS	IP ADDRESS
backend-0	<b>✓ HEALTHY</b>	0	q-m70027n8s0.q-g26716.bosh
backend-1	<b>✓ HEALTHY</b>	0	q-m70029n8s0.q-g26716.bosh
backend-2	<b>✓ HEALTHY</b>	0	q-m70028n8s0.q-g26716.bosh

### Unhealthy nodes

If the health check returns HTTP status code [503](#), the proxy considers the node unhealthy.

This happens when a node becomes non-primary. For more information, see [About Multi-Site replication](#).

The proxy severs existing connections to newly unhealthy node. The proxy routes new connections to a healthy node, assuming such a node exists. Clients are expected to handle reconnecting on connection failure if the entire cluster become inaccessible. The Switchboard shows two nodes with the **Unhealthy** status.

NODES	STATUS	CURRENT SESSIONS	IP ADDRESS
backend-0	✓ HEALTHY	0	q-m70027n8s0.q-g26716.bosh
backend-1	✗ UNHEALTHY	0	q-m70029n8s0.q-g26716.bosh
backend-2	✗ UNHEALTHY	0	q-m70028n8s0.q-g26716.bosh

## Unresponsive nodes

If node health cannot be verified due to an unreachable or unresponsive health check endpoint, the proxy considers the node unhealthy. This might happen if there is a network partition or if the VM running the node and health check failed.

## Monitor node health

You can monitor the health status of your nodes by doing one of the following:

- [Monitor node health using the dashboard](#)
- [Monitor node health using the API](#)

### Monitor node health using the dashboard

Construct the URL for the dashboard

Each MySQL Proxy instance has its own Switchboard dashboard. To access the dashboard, you must construct the dashboard URL.

To construct the URL for the Switchboard dashboard:

1. Find and record the system domain on the **Domains** pane in the TAS for VMs tile.
2. Find and record the number of MySQL Proxy VM instances in your deployment in the **Resource Config** pane.
3. Use the preceding information to build the Switchboard dashboard URL as follows:  
`https://[PROXY-VM-INDEX]-proxy-p-mysql-ert.[SYSTEM-DOMAIN]`

#### Log in to the dashboard

To log in to the Switchboard dashboard:

- In the TAS for VMs tile, the URL in your browser contains the Tanzu Operations Manager fully qualified domain name (FQDN) and the TAS for VMs product GUID, as in the following example:  
`https://OPS-MANAGER-FQDN/products/APPLICATION-SERVICE-PRODUCT-GUID/az_and_network_assignments/edit`  
To log in to the dashboard, you need the user name and password for the MySQL Proxy VM that are stored in the BOSH Director CredHub.  
To obtain them, enter `https://[OPS-MANAGER-FQDN]/api/v0/deployed/products/[APPLICATION-SERVICE-PRODUCT-GUID]/variables?name=mysql-proxy-dashboard-credentials` in to your browser and record the user name and password.
- Enter the dashboard URL you constructed in to your browser and log in using the credentials you obtained in [Construct the URL for the Dashboard](#).

## Use the dashboard

To monitor node health using the Switchboard dashboard:

- To view a list of proxies in your browser, navigate to the URL that you created in [Construct the URL for the Dashboard](#).
- When you are prompted, enter the user name and password that you recorded in [Log in to the Dashboard](#).
- Click the link for the proxy that you want to use to monitor node health.
- If you are prompted, enter the user name and password that you recorded in [Log in to the Dashboard](#).



The screenshot shows the Switchboard dashboard interface. At the top, there is a dark header bar with the 'Switchboard' logo. Below it, a green banner displays the message 'All nodes are healthy!' with a checkmark icon. The main content area is a table with four columns: 'NODES', 'STATUS', 'CURRENT SESSIONS', and 'IP ADDRESS'. There are three rows in the table, each representing a backend node:

NODES	STATUS	CURRENT SESSIONS	IP ADDRESS
backend-0	<span>✓ HEALTHY</span>	0	q-m70027n8s0.q-g26716.bosh
backend-1	<span>✓ HEALTHY</span>	0	q-m70029n8s0.q-g26716.bosh
backend-2	<span>✓ HEALTHY</span>	0	q-m70028n8s0.q-g26716.bosh

## Monitor node health using the API

You can also use the Switchboard API to obtain the information that appears on the Switchboard dashboard. For example, you might want to use the API to write your own app to monitor the cluster.

To monitor node health using the Switchboard API:

- To monitor node health, run:

```
curl https://PROXY-API-USERNAME:PROXY-API-PASSWORD@PROXY-VM-INDEX-proxy-p-mysql-ert.SYSTEM-DOMAIN/v0/backends
```

Where:

- `PROXY-API-USERNAME` is the `username` you recorded in [Log In to the Dashboard](#).
- `PROXY-API-PASSWORD` is the `password` you recorded in [Log In to the Dashboard](#).
- `PROXY-VM-INDEX` is either 0, 1, or 2 depending on the proxy you want to connect to.
- `SYSTEM-DOMAIN` is the system domain found on the **Domains** pane in the TAS for VMs tile.

The preceding command outputs a JSON object similar to:

```
$ curl https://PROXY-API-USERNAME:PROXY-API-PASSWORD@0-proxy-p-mysql-er
t.SYSTEM-DOMAIN/v0/backends
[
  {
    "host": "30a13eb4-b3e0-45f8-8449-8dfada826db2.mysql.tas-subnet.cf-c
09d52d0e3f74dab5f81.bosh",
    "port": 3306,
    "healthy": true,
    "name": "mysql/30a13eb4-b3e0-45f8-8449-8dfada826db2",
    "currentSessionCount": 372,
    "active": true,
    "trafficEnabled": true
  },
  {
    "host": "742cb991-b818-4b1f-b1bb-f45d834d8df6.mysql.tas-subnet.cf-c
09d52d0e3f74dab5f81.bosh",
    "port": 3306,
    "healthy": true,
    "name": "mysql/742cb991-b818-4b1f-b1bb-f45d834d8df6",
    "currentSessionCount": 0,
    "active": false,
    "trafficEnabled": true
  },
  {
    "host": "fc680458-977e-4d1e-8aa5-5ee62fe3e8cc.mysql.tas-subnet.cf-c
09d52d0e3f74dab5f81.bosh",
    "port": 3306,
    "healthy": true,
    "name": "mysql/fc680458-977e-4d1e-8aa5-5ee62fe3e8cc",
    "currentSessionCount": 0,
    "active": false,
    "trafficEnabled": true
  }
]
```

## Scaling your internal MySQL

Here you will learn how to scale down your VMware Tanzu Application Service for VMs (TAS for VMs) MySQL cluster. This page also provides example sizing data from two environments that have significant load on their MySQL clusters.

For additional resources about scaling Internal MySQL, see the [Deployments using internal MySQL](#) section of the *Scaling TAS for VMs* topic and the [Scalable components](#) section of the *High Availability in TAS for VMs* topic.



The procedure does not apply to databases configured as external in the **Databases** pane of the TAS for VMs tile.

TAS for VMs components that use system databases include the Cloud Controller, Diego Brain, Gorouter, and User Authorization and Authentication (UAA) server. For more information, see [TAS for VMs Components](#).

## Scale down your MySQL cluster

This procedure explains how to safely scale your MySQL cluster down to a single node. If you are already running the MySQL cluster with a single node, you do not need to do this procedure.

By default, internal MySQL deploys as a single node. To take advantage of the high availability features of MySQL, you may have scaled the configuration up to three or more server nodes.

### Verify the health of your cluster

Before scaling down your MySQL cluster, you must ensure that the cluster is healthy.

To verify the health of your cluster:

1. Use the Cloud Foundry Command Line Interface (cf CLI) to target the API endpoint of your Operations Manager deployment. Run:

```
cf api api.YOUR-SYSTEM-DOMAIN
```

Where `YOUR-SYSTEM-DOMAIN` is the system domain defined in the **Domains** pane of the TAS for VMs tile.

2. To obtain your UAA admin user credentials:
  1. Click the **Credentials** tab of the TAS for VMs tile.
  2. Locate the **Admin Credentials** entry in the **UAA** section.
  3. Click **Link to Credential**.
3. Log in with the UAA admin credentials you obtained in the previous step by running:

```
cf login -u admin
```

4. Create a test organization to verify the database across all nodes by running:

```
cf create-org data-integrity-test-organization
```

5. To obtain the IP addresses of your MySQL server:
  1. From the Tanzu Operations Manager Installation Dashboard, click the TAS for VMs tile.
  2. Click the **Status** tab.

3. Record the IP addresses for all instances of the **MySQL Server** job.
6. To retrieve Cloud Controller database credentials from CredHub using the Tanzu Operations Manager API:
  1. Follow the procedures in [Using the Tanzu Operations Manager API](#) to authenticate and access the Tanzu Operations Manager API.
  2. Retrieve a list of deployed products by running:

```
curl "https://OPS-MANAGER-FQDN/api/v0/deployed/products" \
-X GET \
-H "Authorization: Bearer UAA-ACCESS-TOKEN"
```

Where:

- **OPS-MANAGER-FQDN** is the fully-qualified domain name (FQDN) of your Tanzu Operations Manager deployment.
  - **UAA-ACCESS-TOKEN** is the access token you recorded in the previous step.
3. In the response to the request described earlier, locate the product with an `installation_name` starting with `cf-` and copy its `guid`.
  4. Run:

```
curl "https://OPS-MANAGER-FQDN/api/v0/deployed/products/PRODUCT-GUID/variables?name=cc-db-credentials" \
-X GET \
-H "Authorization: Bearer UAA-ACCESS-TOKEN"
```

Where:

- **OPS-MANAGER-FQDN** is the fully-qualified domain name (FQDN) of your Tanzu Operations Manager deployment.
  - **PRODUCT-GUID** is the value of `guid` you recorded in the previous step.
  - **UAA-ACCESS-TOKEN** is the access token you recorded in the previous step.
5. Record the Cloud Controller database `username` and `password` from the response to the request.
  7. SSH into the Tanzu Operations Manager VM. Because the procedures vary by IaaS, see [SSH into Tanzu Operations Manager](#) in *Advanced troubleshooting with the BOSH CLI* for instructions specific to your IaaS.
  8. For each of the MySQL server IP addresses that were previously recorded:
    1. Query the new organization by running:

```
mysql -h YOUR-IP -u YOUR-IDENTITY -D ccdb -p -e "select created_at, name
from organizations where name = 'data-integrity-test-organization'"
```

Where:

- **YOUR-IP** is the IP address of the MySQL server.

- YOUR-IDENTITY is the `identity` value of the CCDB credentials you obtained earlier.
2. When prompted, provide the `password` value of the CCDB credentials you obtained earlier.
  3. Examine the output of the `mysql` command and verify the `created_at` date is recent. For example:

```
+-----+-----+
| created_at      | name          |
+-----+-----+
| 2016-05-28 01:11:42 | data-integrity-test-organization |
+-----+-----+
```

9. If each MySQL server instance does not return the same `created_at` result, contact [Broadcom Support](#) before proceeding further or making any changes to your deployment. If each MySQL server instance does return the same result, then you can safely proceed to scaling down your cluster to a single node by performing the steps in the following section.

## Set server instance count to 1

To scale your server instance count to 1:

1. Select **Resource Config** in the TAS for VMs tile.
2. Use the drop-down menu to change the **Instances** count for **MySQL Server** to `1`.
3. Click **Save**, then **Review Pending Changes** and **Apply Changes**.
4. Delete your test organization by running:

```
cf delete-org data-integrity-test-organization
```

## MySQL cluster sizing example

This topic describes a sizing example for internal MySQL in TAS for VMs.

Use this data as guidance to ensure that your MySQL Clusters are scaled to handle the number of app instances running on your deployment.

### Example: Cloud Foundry Diego test environment

The information in this section comes from an environment used by the Diego to test the MySQL cluster with a high load similar to one generated large deployment.

- **IAAS:** GCP
- **App Instances:** 250,000
- **Average SQL Queries Per Minute:** ~5,100,000
- **Average IOPS:**
  - **Reads:** 3.63
  - **Writes:** 363.98

## VM sizing

The following table displays MySQL VM settings for this environment:

Setting	Value
VM Type	n1-standard-16
Storage Volume Type	pd-ssd
Storage Volume Size	1 TB

## Running mysql-diag

Learn how to use the `mysql-diag` tool in VMware Tanzu Operations Manager. `mysql-diag` prints the state of your MySQL highly available (HA) cluster and suggests solutions if your node fails. VMware recommends running this tool against your HA cluster before all deployments.

`mysql-diag` checks the following information about the status of your HA cluster:

- Membership status of all nodes
- Size as it appears to all nodes
- If it needs to be bootstrapped
- If replication is working
- Used disk space and inodes per server

## Run mysql-diag using the BOSH CLI

To use the BOSH CLI to run `mysql-diag`, do the following:

1. Obtain the information needed to use the BOSH CLI by doing the procedure in [Gather Credential and IP Address Information](#).
2. SSH into your Tanzu Operations Manager VM by doing the procedure in [Log in to the Tanzu Operations Manager VM with SSH](#) for your IaaS.
3. Log in to your BOSH Director by doing the procedure in [Authenticate with the BOSH Director VM](#).
4. Identify the VM to log in to with SSH by running the following command:

```
bosh -e MY-ENV -d MY-DEPLOYMENT vms
```

Where:

- `MY-ENV` is the name of your environment.
- `MY-DEPLOYMENT` is the name of your deployment.

5. Record the GUID associated with the `mysql-monitor` VM, also known as the jumpbox VM.
6. SSH into your `mysql-monitor` VM by running the following command:

```
bosh -e MY-ENV -d MY-DEP ssh mysql-monitor/GUID
```

Where:

- `MY-ENV` is the name of your environment.
- `MY-DEPLOYMENT` is the name of your deployment.
- `GUID` is the GUID you recorded in the previous step.

7. View the status of your HA cluster by running the following command:

```
mysql-diag
```

## Example healthy output

The `mysql-diag` command returns the following message if your canary status is healthy:

```
Checking canary status...healthy
```

Example `mysql-diag` output when the tool identifies a healthy HA cluster includes:

- The date
- The canary status, which shows as healthy
- The cluster status of the three service instances
- A table with the headings Host, Name/UUID, WSREP Local State, WSREP Cluster Status, and WSREP Cluster Size. The rows contain:
  - the value for WSREP Local State ('Synced')
  - the value for WSREP Cluster Status ('Primary')
  - the value for WSREP Cluster Size ('3')
- The disk status of the six services instances
- A table with the headings host, name/UUID, persistent disk used, and ephemeral disk used

```
mysql-monitor/5faae86a-a325-44fa-a8ab-24e736e42390:~$ mysql-diag
Wed Jul 19 19:03:54 UTC 2017
Checking canary status...
Checking canary status... healthy
Checking cluster status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2...
Checking cluster status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2...
Checking cluster status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2...
Checking cluster status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2... done
Checking cluster status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2... done
Checking cluster status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2... done
+-----+-----+-----+-----+
| HOST | NAME/UUID | WSREP LOCAL STATE | WSREP CLUSTER STATUS | WSREP CLUSTER SIZE |
+-----+-----+-----+-----+
| 10.244.7.2 | mysql/32665833 | Synced | Primary | 3 |
| 10.244.8.2 | mysql/026d5b79 | Synced | Primary | 3 |
| 10.244.9.2 | mysql/fefced1e | Synced | Primary | 3 |
+-----+-----+-----+-----+
I don't think bootstrap is necessary
Checking disk status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2...
Checking disk status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2...
Checking disk status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2...
Checking disk status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2... done
Checking disk status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2... done
Checking disk status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2... done
+-----+-----+-----+-----+
| HOST | NAME/UUID | PERSISTENT DISK USED | Ephemeral Disk Used |
+-----+-----+-----+-----+
| 10.244.8.2 | mysql/026d5b79 | 28.9% of 9G (0.0% of 0.61M inodes) | 28.3% of 157.4G (6.4% of 10.49M inodes) |
| 10.244.7.2 | mysql/32665833 | 28.7% of 9G (0.0% of 0.61M inodes) | 28.3% of 157.4G (6.4% of 10.49M inodes) |
| 10.244.9.2 | mysql/fefced1e | 28.9% of 9G (0.0% of 0.61M inodes) | 28.3% of 157.4G (6.4% of 10.49M inodes) |
+-----+-----+-----+-----+
```

[View a larger version of this image.](#)

## Example unhealthy output

The `mysql-diag` command returns the following message if your canary status is unhealthy:

Checking canary status...unhealthy

In the event of a broken HA cluster, running `mysql-diag` outputs actionable steps meant to expedite the recovery of that HA cluster. The sample `mysql-diag` output after the tool identifies an unhealthy HA cluster is similar to the output described for the healthy case except that some of the clusters show `getsockopt: connection refused` errors. The output ends with messages marked as `Critical` containing instructions for what to do and what not do to resolve the issues.

```

mysql-monitor/5faae86a-a325-44fa-a8ab-24e736e42390:~$ mysql-diag
Wed Jul 19 17:59:43 UTC 2017
Checking canary status...
Checking canary status... healthy
Checking cluster status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2...
Checking cluster status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2...
Checking cluster status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2...
Checking cluster status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2... dial tcp 10.244.9.2:3306: getsockopt: connection refused
Checking cluster status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2... dial tcp 10.244.7.2:3306: getsockopt: connection refused
Checking cluster status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2... dial tcp 10.244.8.2:3306: getsockopt: connection refused
+-----+-----+-----+-----+
| HOST | NAME/UUID | WSREP LOCAL STATE | WSREP CLUSTER STATUS | WSREP CLUSTER SIZE |
+-----+-----+-----+-----+
| 10.244.9.2 | mysql/fefced1e | N/A - ERROR | N/A - ERROR | N/A - ERROR |
| 10.244.7.2 | mysql/32665833 | N/A - ERROR | N/A - ERROR | N/A - ERROR |
| 10.244.8.2 | mysql/026d5b79 | N/A - ERROR | N/A - ERROR | N/A - ERROR |
+-----+-----+-----+-----+
Checking disk status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2...
Checking disk status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2...
Checking disk status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2...
Checking disk status of mysql/32665833-6a66-45dc-bad1-7a6476787d59 at 10.244.7.2... done
Checking disk status of mysql/026d5b79-6844-4227-9e6a-923dd24de9a6 at 10.244.8.2... done
Checking disk status of mysql/fefced1e-83ce-4f7d-96f1-fb658b69cc81 at 10.244.9.2... done
+-----+-----+-----+-----+
| HOST | NAME/UUID | PERSISTENT DISK USED | EPHEMERAL DISK USED |
+-----+-----+-----+-----+
| 10.244.7.2 | mysql/32665833 | 28.7% of 9G (0.0% of 0.61M inodes) | 28.2% of 157.4G (6.3% of 10.49M inodes) |
| 10.244.8.2 | mysql/026d5b79 | 28.9% of 9G (0.0% of 0.61M inodes) | 28.2% of 157.4G (6.3% of 10.49M inodes) |
| 10.244.9.2 | mysql/fefced1e | 28.9% of 9G (0.0% of 0.61M inodes) | 28.2% of 157.4G (6.3% of 10.49M inodes) |
+-----+-----+-----+-----+
[CRITICAL] You must bootstrap the cluster. Follow these instructions: http://docs.pivotal.io/p-mysql/bootstrapping.html
[CRITICAL] Run the download-logs command:
$ download-logs -d /tmp/output -n 10.244.7.2 -n 10.244.8.2 -n 10.244.9.2
For full information about how to download and use the download-logs command see https://discuss.pivotal.io/hc/en-us/articles/221504408
[WARNING] NOT RECOMMENDED
Do not perform the following unless instructed by Pivotal Support:
- Do not scale down the cluster to one node then scale back. This puts user data at risk.
- Avoid "bosh recreate" and "bosh cck". These options remove logs on the VMs making it harder to diagnose cluster issues.

```

[View a larger version of this image.](#)

## Recovering from MySQL cluster downtime

Learn how to bootstrap your MySQL cluster in the event of a cluster failure.

You can bootstrap your cluster by using one of these methods:

- Run the bootstrap errand. See [Run the Bootstrap errand](#).
- Bootstrap manually. See [Bootstrap manually](#).

## When to bootstrap

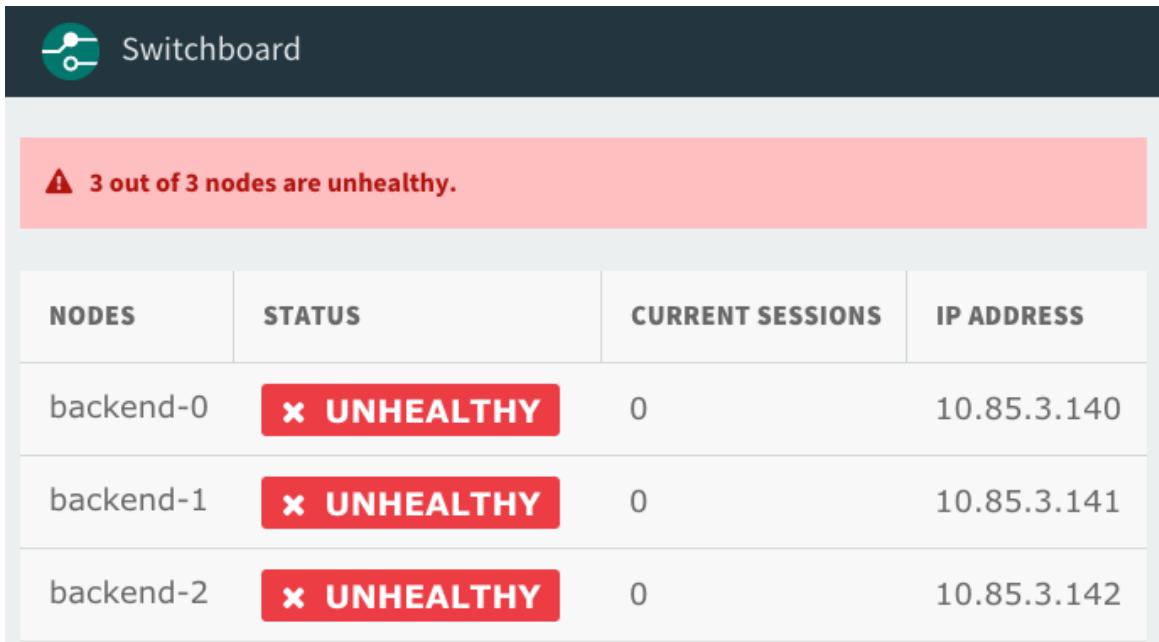
You must bootstrap a cluster that loses quorum. A cluster loses quorum when fewer than half the nodes can communicate with each other for longer than the configured grace period. If a cluster does not lose quorum, individual unhealthy nodes automatically rejoin the cluster after resolving the error, restarting the node, or restoring connectivity.



Bootstrap only if your cluster has lost quorum, as determined by the following steps. If any of the following steps show that your cluster has retained quorum, then do not bootstrap. For example, if the proxy dashboard shows one or two nodes as "Healthy," then your cluster has retained quorum. In such cases, instead of bootstrapping, consider [manually rejoining a node to a cluster](#), taking other steps to diagnose and restore your working cluster, or contacting Broadcom Support for assistance.

To discover if your cluster has lost quorum, look for the following symptoms:

- All nodes appear “Unhealthy” on the proxy dashboard. To log in to the proxy dashboard, see [Log in to proxy dashboard](#).



The screenshot shows the Switchboard proxy dashboard interface. At the top, there is a dark header bar with the "Switchboard" logo and name. Below it, a red banner displays the message "⚠ 3 out of 3 nodes are unhealthy." The main content area is a table with four columns: "NODES", "STATUS", "CURRENT SESSIONS", and "IP ADDRESS". There are three rows, each corresponding to a node named "backend-0", "backend-1", and "backend-2". The "STATUS" column for all three nodes is highlighted in red with the text "✗ UNHEALTHY". The "CURRENT SESSIONS" column shows values of 0 for all three nodes. The "IP ADDRESS" column shows IP addresses 10.85.3.140, 10.85.3.141, and 10.85.3.142 respectively.

NODES	STATUS	CURRENT SESSIONS	IP ADDRESS
backend-0	✗ UNHEALTHY	0	10.85.3.140
backend-1	✗ UNHEALTHY	0	10.85.3.141
backend-2	✗ UNHEALTHY	0	10.85.3.142

- All responsive nodes report the value of `wsrep_cluster_status` as `non-Primary`:

```
mysql> SHOW STATUS LIKE 'wsrep_cluster_status';
+-----+-----+
| Variable_name      | Value   |
+-----+-----+
| wsrep_cluster_status | non-Primary |
+-----+-----+
```

- All unresponsive nodes respond with `ERROR 1047` when using most statement types in the MySQL client:

```
mysql> select * from mysql.user;
ERROR 1047 (08S01) at line 1: WSREP has not yet prepared node for application use
```

## Log in to proxy dashboard

To log in to the proxy dashboard:

1. Get the proxy dashboard credentials by entering the following URL into your web browser and recording the output:

```
https://OPS-MAN-FQDN/api/v0/deployed/products/TAS-FOR-VMS-GUID/variables?name=mysql-proxy-dashboard-credentials
```

Where:

- `OPS-MAN-FQDN` is the fully-qualified domain name (FQDN) for your Tanzu Operations Manager deployment.

- `TAS-FOR-VMS-GUID` is the GUID of your TAS for VMs tile. For more information about finding your GUID, see the [Tanzu Operations Manager API Reference](#)
2. Log in to the proxy dashboard by entering the following URL into your web browser:

```
https://BOSH-JOB-INDEX-proxy-p-mysql-ert.YOUR-SYSTEM-DOMAIN/
```

Where:

- `BOSH-JOB-INDEX` is `0`, `1`, or `2`, representing the three proxies deployed on each node.
- `SYSTEM-DOMAIN` is the **System domain** you configured in the **Domains** pane of the BOSH Director tile.

## Run the Bootstrap errand

VMware Tanzu Operations Manager includes a **BOSH errand** that automates the manual bootstrapping procedure in the [Bootstrap manually](#) section below.

It finds the node with the highest transaction sequence number and asks it to start up by itself (i.e. in bootstrap mode) and then asks the remaining nodes to join the cluster.

In most cases, running the errand recovers your cluster. But, certain scenarios require additional steps.

## Discover type of cluster failure

To verify which set of instructions to follow:

1. List your MySQL instances by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT instances
```

Where:

- `YOUR-ENV` is the environment where you deployed the cluster.
- `YOUR-DEPLOYMENT` is the deployment cluster name.

For example:

```
$ bosh -e prod -d mysql instances
```

2. Find and record the `Process State` for your MySQL instances. In the following example output, the MySQL instances are in the `failing` process state.

Instance	Pr
ocess State AZ IPs	
backup-restore/c635410e-917d-46aa-b054-86d222b6d1c0	ru
nning us-central1-b 10.0.4.47	
bootstrap/a31af4ff-e1df-4ff1-a781-abc3c6320ed4	-
us-central1-b -	
broker-registrar/1a93e53d-af7c-4308-85d4-3b2b80d504e4	-
us-central1-b 10.0.4.58	
cf-mysql-broker/137d52b8-a1b0-41f3-847f-c44f51f87728	ru
nning us-central1-c 10.0.4.57	

cf-mysql-broker/28b463b1-cc12-42bf-b34b-82ca7c417c41	ru
nning us-central1-b 10.0.4.56	-
deregister-and-purge-instances/4cb93432-4d90-4f1d-8152-d0c238fa5aab	-
us-central1-b -	
monitoring/f7117dcf-1c22-495e-a99e-cf2add90dea9	ru
nning us-central1-b 10.0.4.48	-
mysql/220fe72a-9026-4e2e-9fe3-1f5c0b6bf09b	fa
iling us-central1-b 10.0.4.44	-
mysql/28a210ac-cb98-4ab4-9672-9f4c661c57b8	fa
iling us-central1-f 10.0.4.46	-
mysql/c1639373-26a2-44ce-85db-c9fe5a42964b	fa
iling us-central1-c 10.0.4.45	-
proxy/87c5683d-12f5-426c-b925-62521529f64a	ru
nning us-central1-b 10.0.4.60	-
proxy/b0115ccd-7973-42d3-b6de-edb5ae53c63e	ru
nning us-central1-c 10.0.4.61	-
rejoin-unsafe/8ce9370a-e86b-4638-bf76-e103f858413f	-
us-central1-b -	
smoke-tests/e026aaef-efd9-4644-8d14-0811cb1ba733	-
us-central1-b 10.0.4.59	-

3. Choose your scenario:

- If your MySQL instances are in the `failing` state, continue to [Scenario 1](#).
- If your MySQL instances are in the `-` state, continue to [Scenario 2](#).
- If your MySQL instances are in the `stopped` state, continue to [Scenario 3](#).

## Scenario 1: VMs running, cluster disrupted

In this scenario, the VMs are running, but the cluster has been disrupted.

To bootstrap in this scenario:

1. Run the bootstrap errand on the VM where the bootstrap errand is co-located, by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT run-errand bootstrap
```

Where:

- `YOUR-ENV` is the name of your environment.
- `YOUR-DEPLOYMENT` is the name of your deployment.



The errand runs for a long time, during which no output is returned.

The command returns many lines of output, eventually followed by:

```
Bootstrap errand completed
[stderr]
+ echo 'Started bootstrap errand ...'
+ JOB\_DIR=/var/vcap/jobs/bootstrap
+ CONFIG\_PATH=/var/vcap/jobs/bootstrap/config/config.yml
```

```
+ /var/vcap/packages/bootstrap/bin(cf-mysql-bootstrap -configPath=/var/vcap/jobs/bootstrap/config/config.yml
+ echo 'Bootstrap errand completed'
+ exit 0
Errand 'bootstrap' completed successfully (exit code 0)
```

2. If the errand fails, run the bootstrap errand command again after a few minutes. The bootstrap errand might not work the first time.
3. If the errand fails after several tries, bootstrap your cluster manually. See [Bootstrap manually](#) below.

## Scenario 2: VMs terminated or lost

In severe circumstances, such as a power failure, it is possible to lose all your VMs. You must re-create them before you can begin recovering the cluster.

When MySQL instances are in the `-` state, the VMs are lost. The procedures in this scenario bring the instances from a `-` state to a `failing` state. Then you run the bootstrap errand similar to [Scenario 1](#) and restore configuration.

To recover terminated or lost VMs, follow the procedures in the sections below:

1. [Re-create the missing VMs](#): Bring MySQL instances from a `-` state to a `failing` state.
2. [Run the Bootstrap errand](#): Because your instances are now in the `failing` state, continue similarly to [Scenario 1](#).
3. [Restore the BOSH configuration](#): Go back to unignoring all instances and redeploy. This is a critical and mandatory step.



If you do not set each of your ignored instances to `unignore`, your instances are not updated in future deploys. You must follow the procedure in the final section of [Scenario 2, Restore the BOSH Configuration](#).

### Recreate the missing VMs

The procedure in this section uses BOSH to re-create the VMs, install software on them, and try to start the jobs.

The following procedure allows you to:

- Redeploy your cluster while expecting the jobs to fail.
- Instruct BOSH to ignore the state of each instance in your cluster. This allows BOSH to deploy the software to each instance even if the instance is failing.

To re-create your missing VMs:

1. If BOSH Resurrector is activated, deactivate it by running:

```
bosh -e YOUR-ENV update-resurrection off
```

Where `YOUR-ENV` is the name of your environment.

- Download the current manifest by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT manifest > /tmp/manifest.yml
```

Where:

- YOUR-ENV is the name of your environment.
- YOUR-DEPLOYMENT is the name of your deployment.

- Redeploy deployment by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT deploy /tmp/manifest.yml
```

Where:

- YOUR-ENV is the name of your environment.
- YOUR-DEPLOYMENT is the name of your deployment.



Expect one of the MySQL VMs to fail. Deploying causes BOSH to create new VMs and install the software. Forming a cluster is in a subsequent step.

- View the instance GUID of the MySQL VM that attempted to start by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT instances
```

Where:

- YOUR-ENV is the name of your environment.
- YOUR-DEPLOYMENT is the name of your deployment.

Record the instance GUID, which is the string after mysql/ in your BOSH instances output.

- Instruct BOSH to ignore the MySQL VM that just attempted to start, by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT ignore mysql/INSTANCE-GUID
```

Where:

- YOUR-ENV is the name of your environment.
- YOUR-DEPLOYMENT is the name of your deployment.
- INSTANCE-GUID is the GUID of your instance you recorded in the previous step.

- Repeat steps 3 through 5 until all instances have attempted to start.

- If you deactivated the BOSH Resurrector in step 1, re-enable it by running:

```
bosh -e YOUR-ENV update-resurrection on
```

Where YOUR-ENV is the name of your environment.

- Confirm that your MySQL instances have gone from the - state to the failing state by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT instances
```

Where:

- `YOUR-ENV` is the name of your environment.
- `YOUR-DEPLOYMENT` is the name of your deployment.

### Run the Bootstrap errand

After you recreate the VMs, all instances now have a `failing` process state and have the MySQL code. You must run the bootstrap errand to recover the cluster.

To bootstrap:

1. Run the bootstrap errand by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT run-errand bootstrap
```

Where:

- `YOUR-ENV` is the name of your environment.
- `YOUR-DEPLOYMENT` is the name of your deployment.



The errand runs for a long time, during which no output is returned.

The command returns many lines of output, eventually with the following successful output:

```
Bootstrap errand completed
[stderr]
echo 'Started bootstrap errand ...'
JOB\_DIR=/var/vcap/jobs/bootstrap
CONFIG\_PATH=/var/vcap/jobs/bootstrap/config/config.yml
/var/vcap/packages/bootstrap/bin/cf-mysql-bootstrap -configPath=/var/
vcap/jobs/bootstrap/config/config.yml
echo 'Bootstrap errand completed'
exit 0
Errand 'bootstrap' completed successfully (exit code 0)
```

2. If the errand fails, run the bootstrap errand command again after a few minutes. The bootstrap errand might not work immediately.
3. See that the errand completes successfully in the shell output and continue to [Restore the BOSH configuration](#) below.

After you complete the bootstrap errand, you might still see instances in the `failing` state. Continue to the next section anyway.



If you do not set each of your ignored instances to `unignore`, your instances are never updated in future deploys.

To restore your BOSH configuration to its previous state, this procedure unignores each instance that was previously ignored:

1. For each ignored instance, run:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT unignore mysql/INSTANCE-GUID
```

Where:

- `YOUR-ENV` is the name of your environment.
- `YOUR-DEPLOYMENT` is the name of your deployment.
- `INSTANCE-GUID` is the GUID of your instance.

2. Redeploy your deployment by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT deploy
```

Where:

- `YOUR-ENV` is the name of your environment.
- `YOUR-DEPLOYMENT` is the name of your deployment.

3. Verify that all `mysql` instances are in a `running` state by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT instances
```

Where:

- `YOUR-ENV` is the name of your environment.
- `YOUR-DEPLOYMENT` is the name of your deployment.

## Bootstrap manually

If the bootstrap errand cannot automatically recover the cluster, you must do the steps manually.

Follow the procedures in the sections below to manually bootstrap your cluster.



The following procedures are prone to user error and can cause lost data if followed incorrectly. Follow the procedure in [Bootstrap with the BOSH Errand first](#), and only resort to the manual process if the errand fails to repair the cluster.

### Shut down MySQL

Follow these steps to stop the `galera-init` process for each node in the cluster. For each node, record if the `monit stop` command was successful:

1. SSH into the node using the procedure in [Advanced troubleshooting with the BOSH CLI](#).
2. To shut down the `mysqld` process on the node, run:

```
monit stop galera-init
```

3. Record if the `monit` command succeeds or exits with an error:

- If **monit succeeds in stopping galera-init**, then you can use `monit` to restart this node. Follow all the steps below including the steps marked **Monit Restart** but omitting the steps marked **Manual Redeploy**.
- If **monit exits with the following error**, then you must manually deploy this node:

```
Warning: include files not found '/var/vcap/monit/job/*.monitrc'
monit: action failed -- There is no service by that name
```

Follow all the steps below including the steps marked **Manual Redeploy** but omitting the steps marked **Monit Restart**.



Do not proceed with Manual Redeploy if you have lost quorum while upgrading your Tanzu Platform for Cloud Foundry or service instance deployment (using Tanzu Operations Manager **Apply Changes**, `cf update-service`, or `bosh deploy` operations). Manual Redeploy requires a stable manifest, which is used to predictably recreate damaged VMs. Upgrades introduce a second manifest, which can trigger unpredictable outcomes if you proceed with the following Manual Redeploy steps. If you have lost both HA quorum and monit capability on your VMs while upgrading your database, contact Broadcom Support for assistance.

4. Repeat the preceding steps for each node in the cluster.

You cannot bootstrap the cluster unless you have shut down the `mysqld` process on all nodes in the cluster.

## Verify which node to bootstrap

To avoid losing data, you must bootstrap from a node in the cluster that has the highest transaction sequence number (`seqno`).

For each node in the cluster, to find its `seqno`:

1. SSH into the node using the procedure in [Advanced troubleshooting with the BOSH CLI](#).
2. Find `seqno` values in the node's Galera state file, `grastate.dat` by running:

```
cat /var/vcap/store/pxc-mysql/grastate.dat | grep 'seqno:'
```

3. Do one of the following, based on the last and highest `seqno` value in the `grep` output:
  - If **seqno is a positive integer**, then the node shut down gracefully. Record this number for comparison with the latest `seqno` of other nodes in the cluster.
  - If **seqno is -1**, then the node crashed or was stopped. Proceed as follows to attempt to recover the `seqno` from the database:
    1. Temporarily start the database and append the last sequence number to its error log by running:

```
$ /var/vcap/jobs/pxc-mysql/bin/get-sequence-number
```

2. The output of the `get-sequence-number` utility looks similar to this:

```
{ "cluster_uuid": "1f594c30-a709-11ed-a00e-5330bbda96d3", "seqno": 4237, "instance_id": "4213a73e-069f-4ac7-b01b-43068ab312b6" }
```

The `seqno` in the output is `4237`.

4. After you retrieve the `seqno` for all nodes in your cluster, identify the one with the highest `seqno`. If multiple nodes share the same highest `seqno`, and it is not `-1`, you can bootstrap from any of them.

## Bootstrap the first node

After discovering the node with the highest `seqno`, do the following to bootstrap the node:



Only run these bootstrap commands on the node with the highest `seqno`. Otherwise the node with the highest `seqno` is unable to join the new cluster unless its data is abandoned. Its `mysqld` process exits with an error. For more information about intentionally abandoning data, see the architecture sections in the [VMware SQL with MySQL for Tanzu Application Service documentation](#).

1. SSH into the node using the procedure in [Advanced troubleshooting with BOSH CLI](#).
2. Update the node state to trigger its initialization of the cluster by running:

```
echo -n "NEEDS_BOOTSTRAP" > /var/vcap/store/pxc-mysql/state.txt
```

3. **Monit Restart:** If when doing [Shut down MySQL](#) you successfully used `monit` to shut down your `galera-init` process, then re-launch the `mysqld` process on the new bootstrap node.

1. Start the `mysqld` process by running:

```
monit start galera-init
```

2. It can take up to ten minutes for `monit` to start the `mysqld` process. To confirm if the `mysqld` process has started, run:

```
watch monit summary
```

If `monit` succeeds in starting the `galera-init` process, then the output includes the line `Process 'galera-init' running`.

4. **Manual Redeploy:** If when doing [Shut down MySQL](#) you encountered `monit` errors, then redeploy the `mysqld` software to your bootstrap node as follows:

1. Leave the MySQL SSH login shell and return to your local environment.
2. Target BOSH on your bootstrap node by instructing it to ignore the other nodes in your cluster. For nodes all nodes except the bootstrap node you identified earlier, run:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT ignore mysql/M
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT ignore mysql/N
```

Where `N` and `M` are the numbers of the non-bootstrapped nodes. For example, if you bootstrap node 0, then `M=1` and `N=2`.

3. Turn off the BOSH Resurrector by running:

```
bosh update-resurrection off
```

4. Use the BOSH manifest to bootstrap your bootstrap machine by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT manifest > /tmp/manifest.yml
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT deploy /tmp/manifest.yml
```

## Restart remaining nodes

After the bootstrapped node is running, restart the remaining nodes.

The procedure to follow for restarting a node depends on the output you got for that node when doing [Shutdown MySQL](#). Do one of the following procedures:

### Monit restart

If in [Shutdown MySQL](#) you successfully used `monit` to shut down your `galera-init` process, then restart the nodes as follows:

1. SSH into the node using the procedure in [Advanced troubleshooting with BOSH CLI](#).
2. Start the `mysqld` process with `monit` by running:

```
monit start galera-init
```

If the Interruptor (see the [MySQL documentation](#)) prevents the node from starting, follow the manual procedure to force the node to rejoin the cluster. See [Manually force a MySQL node to rejoin if a node cannot rejoin the HA cluster](#).



Forcing a node to rejoin the cluster is a destructive procedure. Only follow the procedure with the help of [Broadcom Support] (<https://www.broadcom.com/support>).

3. If the `monit start` command fails, it might be because the node with the highest `seqno` is `mysql/0`.

In this case:

1. Ensure that BOSH ignores updating `mysql/0` by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT ignore mysql/0
```

Where:

- `YOUR-ENV` is the name of your environment.

- YOUR-DEPLOYMENT is the name of your deployment.
2. Navigate to Tanzu Operations Manager in a browser, log in, and click **Apply Changes**.
  3. When the deploy finishes, run the following command from the Tanzu Operations Manager VM:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT unignore mysql/0
```

Where:

- YOUR-ENV is the name of your environment.
- YOUR-DEPLOYMENT is the name of your deployment.

## Manual redeploy

If in doing [Shut down MySQL](#), you encountered `monit` errors, then restart the nodes as follows:

1. Instruct BOSH to no longer ignore the non-bootstrap nodes in your cluster by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT unignore mysql/M
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT unignore mysql/N
```

Where `N` and `M` are the numbers of the non-bootstrapped nodes. For example, if you bootstrap node 0, then `M=1` and `N=2`.

2. Redeploy software to the other two nodes and have them rejoin the cluster, bootstrapped from the node above by running:

```
bosh -e YOUR-ENV -d YOUR-DEPLOYMENT deploy /tmp/manifest.yml
```

You only need to run this command once to deploy both the nodes that you unignored in the earlier step.

3. With your redeploys completed, turn the BOSH Resurrector back on by running:

```
bosh -e YOUR-ENV update-resurrection on
```

## Verify that the nodes have joined the cluster

The final task is to verify that all the nodes have joined the cluster.

1. SSH into the bootstrap node then run the following command to output the total number of nodes in the cluster:

```
mysql> SHOW STATUS LIKE 'wsrep_cluster_size';
```

## Manually force a MySQL node to rejoin if a node cannot rejoin the HA cluster

When a MySQL node cannot rejoin the HA cluster automatically, a Tanzu Application Service (TAS for VMs) operator must manually force the node to rejoin. The following procedure applies to TAS for VMs MySQL

and MySQL tile HA clusters. This section describes the case where a single node is joined to a cluster. For bootstrapping, see the TAS for VMs or MySQL tile documentation.

When a node cannot rejoin the HA (Percona XtraDB Cluster - PXC) cluster automatically, an operator needs to manually force a MySQL node to rejoin.

If your HA cluster is experiencing downtime or is in a degraded state, VMware recommends first running the `mysql-diag` tool to gather information about the current state of the cluster. This tool will either report a healthy cluster with (typically) 3 running nodes, a cluster in quorum with two running nodes and a third node needing to re-join, or a cluster that has lost quorum and requires a bootstrap. The `mysql-diag` tool is available on the `mysql_monitor` instance for a TAS for VMs internal cluster or on the `mysql_jumpbox` instance for a MySQL tile HA service instance.

This procedure removes all the data from a server node, forces it to join the cluster, receiving a current copy of the data from one of the other nodes already in the cluster. The steps are slightly different based on which MySQL cluster this is for.

#### Cautions:

- Do not do this if there is any data on the local node that you need to preserve.
- The other two nodes must be online and healthy. You can validate this by looking at the `mysql-diag` output or checking the MySQL Proxy logs (i.e., `grep 'Healthcheck failed on backend' proxy.combined.log`). `mysql-diag` reports a healthy node as “Synced” and “Primary”.

For a TAS MySQL cluster or a MySQL tile HAS cluster:

1. Log into the instance as `root`.
2. Run `monit stop galera-init`. Skip to step 3 if the monit job is unavailable.
3. Ensure mysql is stopped by running `ps auxw | grep mysqld`. Kill the `mysqld` process(es) if they are running.
4. Run `mv /var/vcap/store/pxc-mysql /var/vcap/store/pxc-mysql-backup` (or if disk space is a concern, run `rm -rf /var/vcap/store/pxc-mysql`). Clean up the backup after successfully joining the node to the cluster.
5. Run `/var/vcap/jobs/pxc-mysql/bin/pre-start`. An error code of 0 indicates success.
6. Restart the database on the instance using one of these commands:
  - If the monit job is available, run `monit start galera-init`
  - If the instance has no `galera-init` monit job, run `bosh -d deploymentName restart mysql/instanceGUID --no-converge`

## User accounts and communications

In this section:

- [TAS for VMs user types](#)
- [Creating and managing users with the cf CLI](#)
- [Creating and managing users with the UAA CLI \(UAAC\)](#)
- [Creating new TAS for VMs user accounts](#)

- Configuring UAA password policy
- Adding existing SAML or LDAP users to a TAS for VMs deployment
- Configuring app security groups for email notifications
- Getting started with the Notifications Service
- **UAA**
  - User Account and Authentication server
  - User Account and Authentication concepts
  - Identity providers in UAA
  - UAA performance metrics
- **Configuring authentication and enterprise SSO for TAS for VMs**
  - Configuring authentication and enterprise SSO for TAS for VMs
  - Configuring CA as an identity provider
  - Configuring PingFederate as an identity provider

## TAS for VMs user types

Here are the types of VMware Tanzu Application Service for VMs (TAS for VMs) users, the roles and permissions for TAS for VMs users, and who creates and manages user accounts.

TAS for VMs users are app developers, managers, and auditors who work within orgs and spaces. There are virtual compartments within a deployment where TAS for VMs users can run apps and locally manage their roles and permissions.

A Role based Access Control (RBAC) system defines and maintains the different TAS for VMs user roles:

- Org Manager, Org Auditor, Org Billing Manager
- Space Manager, Space Developer, Space Auditor

For more information about TAS for VMs user roles and what actions users with these roles can take within the orgs and spaces they belong to, see [Orgs, roles, spaces, permissions](#).

## TAS for VMs user tools

All TAS for VMs users use system tools such as the Cloud Foundry Command Line Interface (cf CLI), Operations Manager Metrics, and Apps Manager, a dashboard for managing TAS for VMs users, orgs, spaces, and apps. Space Developer TAS for VMs users work with their software development tools and the apps deployed on host VMs.

For more information about Apps Manager, see [Using Apps Manager](#).

## TAS for VMs user accounts

When an operator configures TAS for VMs for the first time, they specify one of the following authentication systems for TAS for VMs user accounts:

- Internal authentication, using a new UAA database created for TAS for VMs. This system-wide UAA differs from the Tanzu Operations Manager internal UAA, which only stores Tanzu Operations Manager Admin accounts.
- External authentication, through an existing identity provider accessed through SAML or LDAP protocol.

In either case, TAS for VMs user role settings are saved internally in the Cloud Controller Database, separate from the internal or external user store.

Org and Space Managers then use Apps Manager to invite and manage additional TAS for VMs users within their orgs and spaces. TAS for VMs users with proper permissions can also use the cf CLI to assign user roles. For more information, see [Managing User Roles with Apps Manager](#).

## User types summary

The following table summarizes TAS for VMs user types, their roles, the tools they use, the System of Record (SOR) that stores their accounts, and what accounts they can provision.

User type	TAS for VMs users
Available roles	<ul style="list-style-type: none"> <li>UAAAAdministrator</li> <li>Org Manager</li> <li>Org Auditor</li> <li>Org Billing Manager</li> <li>Space Manager</li> <li>Space Developer</li> <li>Space Auditor</li> </ul>
Tools they use	<ul style="list-style-type: none"> <li>cf CLI</li> <li>CAPI</li> <li>Apps Manager</li> <li>Operations Manager metrics</li> <li>Marketplace</li> </ul>
Account SOR	TAS for VMs user store through UAA <i>or</i> External store through SAML or LDAP
Accounts they can provision	TAS for VMs users within permitted orgs and spaces, and end users of the app

## Creating and managing users with the cf CLI

You can manage users with the cf CLI. Learn how to view users by role, assign roles, and remove roles from a user.

Operations Manager uses role-based access control, with each role granting permissions in either an organization or an application space.

For more information, see [Organizations, spaces, roles, and permissions](#).

## About roles

To manage all users, organizations, and roles with the Cloud Foundry Command Line Interface (cf CLI), log in with your admin credentials. In Tanzu Operations Manager, see the **Credentials** tab in the TAS for VMs tile for the admin name and password.

If the feature flag `set_roles_by_username` is activated, Org Managers can [assign org roles](#) to existing users in their org and Space Managers can [assign space roles](#) to existing users in their space. For more information about using feature flags, see the [Feature Flags](#) topic.

## Creating and deleting users

FUNCTION	COMMAND	EXAMPLE
Create a new user	<code>cf create-user USERNAME PASSWORD</code>	<code>cf create-user Alice pa55w0rd</code>
Create a new user, and prompt for password for better security	<code>cf create-user USERNAME -- password-prompt</code>	<code>cf create-user Alice</code>
Create a new user, specifying LDAP as an external identity provider	<code>cf create-user USERNAME -- origin ORIGIN</code>	<code>cf create-user Aayah ldap</code>
Create a new user, specifying SAML or OpenID Connect as an external identity provider	<code>cf create-user USERNAME -- origin ORIGIN</code>	<code>cf create-user Aiko provider-alias</code>
Delete a user	<code>cf delete-user USERNAME</code>	<code>cf delete-user Alice</code>

## Creating administrator accounts

To create a new administrator account, use the [UAA CLI](#).



The cf CLI cannot create new administrator accounts.

## Org and app space roles

You can have one or more roles. The combination of these roles defines your overall permissions in the org and within specific app spaces in that org.

### Org roles

Valid [org roles](#) are OrgManager, BillingManager, and OrgAuditor.

FUNCTION	COMMAND	EXAMPLE
View the organizations belonging to an account.	<code>cf orgs</code>	<code>cf orgs</code>
View all users in an organization by role.	<code>cf org-users ORGANIZATION-NAME</code>	<code>cf org-users my-example-org</code>
Assign an org role to a user.	<code>cf set-org-role USERNAME ORGANIZATION-NAME ROLE</code>	<code>cf set-org-role Alice my-example- org OrgManager</code>

FUNCTION	COMMAND	EXAMPLE
Remove an org role from a user.	cf unset-org-role USERNAME ORGANIZATION-NAME ROLE	cf unset-org-role Alice my-example-org OrgManager

If multiple accounts share a username, `set-org-role` and `unset-org-role` return an error. See [Identical Usernames in Multiple Origins](#) for details.

## App space roles

Each app space role applies to a specific app space.

Valid [app space roles](#) are SpaceManager, SpaceDeveloper, and SpaceAuditor.

FUNCTION	COMMAND	EXAMPLE
View the spaces in an org.	cf spaces	cf spaces
View all users in a space by role.	cf space-users ORGANIZATION-NAME SPACE-NAME	cf space-users my-example-org development
Assign a space role to a user.	cf set-space-role USERNAME ORGANIZATION-NAME SPACE-NAME ROLE	cf set-space-role Alice my-example-org development SpaceAuditor
Remove a space role from a user.	cf unset-space-role USERNAME ORGANIZATION-NAME SPACE-NAME ROLE	cf unset-space-role Alice my-example-org development SpaceAuditor

If multiple accounts share a username, `set-space-role` and `unset-space-role` return an error. See [Identical Usernames in Multiple Origins](#) for details.

## Creating and managing users with the UAA CLI (UAAC)

Using the Cloud Foundry User Account and Authentication Command Line Interface (UAAC), you can create users in the UAA server.

The UAAC only creates users in UAA, and does not assign roles in the Cloud Controller database (CCDB). In general, admins create users using the Cloud Foundry Command Line Interface (cf CLI). The cf CLI both creates user records in the UAA and associates them with org and space roles in the CCDB. Before admins can assign roles to the user, the user must log in through Apps Manager or the cf CLI for the user record to populate the CCDB.

For more information on creating and managing users, see [Creating and Managing Users with the cf CLI](#).

For more information, see [UAA Overview](#), [UAA Sysadmin Guide](#) in the UAA repository on GitHub, and [Docs](#) in the UAA repository on GitHub.



UAAC requires Ruby v2.3.1 or later. If you have an earlier version of Ruby installed, install Ruby v2.3.1 or later before using the UAAC.

For more information about which roles can perform various operations in Operations Manager, see [User roles in Orgs, Spaces, Roles, and Permissions](#).

## Create an admin user

To create an admin user for UAA:

1. Install the UAAC by running:

```
gem install cf-uaac
```

2. Target your UAA server by running:

```
uaac target uaa.UAA-DOMAIN
```

Where `UAA-DOMAIN` is the domain of your UAA server.

3. Record the `uaa:admin:client_secret` from your deployment manifest.
4. Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin secret you recorded in the previous step.

UAAC stores the token in `~/.uaac.yml`.

5. Display the users and apps authorized by the UAA server, as well as the permissions granted to each user and app, by running:

```
uaac contexts
```

6. In the output from `uaac contexts`, check the `scope` section of the `client_id: admin` user for `scim.write`. The value `scim.write` represents sufficient permissions to create accounts.
7. If the admin user lacks permissions to create accounts, add the permissions:

1. Add the necessary permissions to the admin user account on the UAA server by running:

```
uaac client update admin --authorities "EXISTING-PERMISSIONS scim.write"
```

Where `EXISTING-PERMISSIONS` is the current contents of the `scope` section from the output from `uaac contexts`.

2. Delete the local token by running:

```
uaac token delete
```

3. Obtain an updated access token from the UAA server by running:

```
uaac token client get admin
```

8. Create an admin user by running:

```
uaac user add NEW-ADMIN-USERNAME -p NEW-ADMIN-PASSWORD --emails NEW-ADMIN-EMAIL
```

Where:

- `NEW-ADMIN-USERNAME` is the username you want to give the admin user.

- NEW-ADMIN-PASSWORD is the password you want to give the admin user.
  - NEW-ADMIN-EMAIL is the email address of the admin user.
9. Add the new admin user to the groups `cloud_controller.admin`, `uaa.admin`, `scim.read`, and `scim.write` by running:

```
uaac member add GROUP NEW-ADMIN-USERNAME
```

Where:

- GROUP is the name of the group to which you want to add the new admin user.
- NEW-ADMIN-USERNAME is the username of the new admin user.

## Create an admin read-only user

The admin read-only account can view but not modify almost all Cloud Controller API resources. The admin read-only account cannot view process `stats` or `logs`.

To create an admin read-only user account:

1. Obtain the credentials of the admin client you created in [Create an Admin User](#), or see the `uaa:scim` section of your deployment manifest for the user name and password of an admin user.
2. Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin secret you recorded in the previous step.

UAAC stores the token in `~/.uaac.yml`.

3. Create an admin read-only user by running:

```
uaac user add NEW-ADMIN-RO-USERNAME -p NEW-ADMIN-RO-PASSWORD --emails NEW-ADMIN-RO-EMAIL
```

Where:

- NEW-ADMIN-RO-USERNAME is the username you want to give the admin read-only user.
- NEW-ADMIN-RO-PASSWORD is the password you want to give the admin read-only user.
- NEW-ADMIN-RO-EMAIL is the email address of the admin read-only user.

4. Add the new admin user to the groups `cloud_controller.admin_read_only` and `scim.read` by running:

```
uaac member add GROUP NEW-ADMIN-RO-USERNAME
```

Where:

- GROUP is the name of the group to which you want to add the new admin read-only user.
- NEW-ADMIN-RO-USERNAME is the username of the new admin read-only user.

## Create a global auditor

The global auditor account has read-only access to almost all Cloud Controller API resources but cannot access secret data such as environment variables. The global auditor account cannot view process `stats` or `logs`.

To create a global auditor account:

1. Obtain the credentials of the admin client you created in [Create an admin user](#), or see the `uaa:scim` section of your deployment manifest for the user name and password of an admin user.
2. Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin secret you recorded in the previous step.

UAAC stores the token in `~/.uaac.yml`.

3. Create a global auditor user by running:

```
uaac user add NEW-GLOBAL-AUDITOR-USERNAME -p NEW-GLOBAL-AUDITOR-PASSWORD --email NEW-GLOBAL-AUDITOR-EMAIL
```

Where:

- `NEW-GLOBAL-AUDITOR-USERNAME` is the username you want to give the admin read-only user.
- `NEW-GLOBAL-AUDITOR-PASSWORD` is the password you want to give the admin read-only user.
- `NEW-GLOBAL-AUDITOR-EMAIL` is the email address of the admin read-only user.

4. To ensure that the `cloud_controller.global_auditor` group exists, run:

```
uaac group add cloud_controller.global_auditor
```

5. Add the new global auditor user to the `cloud_controller.global_auditor` group by running:

```
uaac member add GROUP NEW-GLOBAL-AUDITOR-USERNAME
```

Where:

- `GROUP` is the name of the group to which you want to add the new global auditor user.
- `NEW-GLOBAL-AUDITOR-USERNAME` is the username of the new global auditor user.

## Grant admin permissions to an external group (SAML, LDAP, or OIDC)

To grant all users under an external group admin permissions:

1. Obtain the credentials of the admin client you created in [Create an Admin User](#), or see the `uaa:scim` section of your deployment manifest for the user name and password of an admin user.

- Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin secret you recorded in the previous step.

UAAC stores the token in `~/.uaac.yml`.

- Follow the procedure that corresponds to your use case:

- [Grant Admin Permissions for LDAP](#)
- [Grant Admin Permissions for SAML and OIDC](#)

The UAA does not grant scopes for users in external groups until the next time the user logs in. This means that users granted scopes from external group mappings must log out from Operations Manager and log back in before their new scope takes effect.

## Grant admin permissions for LDAP

To grant admin permissions to all users under the mapped LDAP group:

- Run:

```
uaac group map --name scim.read "GROUP-DISTINGUISHED-NAME"
```

Where `GROUP-DISTINGUISHED-NAME` is the name of the LDAP group.

- Run:

```
uaac group map --name scim.write "GROUP-DISTINGUISHED-NAME"
```

Where `GROUP-DISTINGUISHED-NAME` is the name of the LDAP group.

- Run:

```
uaac group map --name cloud_controller.admin "GROUP-DISTINGUISHED-NAME"
```

Where `GROUP-DISTINGUISHED-NAME` is the name of the LDAP group.

## Grant admin permissions for SAML and OIDC

To grant admin permissions to all users under the mapped SAML or OIDC group:

- Retrieve the name of your SAML provider by navigating to the TAS for VMs tile on the Tanzu Operations Manager Installation Dashboard, selecting **Authentication and Enterprise SSO**, and recording the value under **Provider name**. For more information about configuring TAS for VMs for a SAML identity provider, see the [Configure TAS for VMs to Use a SAML Identity Provider](#) section of the *Configuring authentication and enterprise SSO for TAS for VMs* topic.
- Grant all users under the mapped SAML or OIDC group admin permissions by running:

```
uaac group map --name scim.read "GROUP-NAME" --origin PROVIDER-NAME
uaac group map --name scim.write "GROUP-NAME" --origin PROVIDER-NAME
```

```
uaac group map --name cloud_controller.admin "GROUP-NAME" --origin PROVIDER-NAME
```

Where:

- GROUP-NAME is the name of the SAML or OIDC group.
- PROVIDER-NAME is the name of your SAML or OIDC IDP.

For OIDC, make sure you configure the IDP's attribute mappings and map `external_groups` to the groups field in the OIDC ID Token issued by the IDP.

## Create users

To create new users:

1. Obtain the credentials of the admin client you created in [Create an Admin User](#), or see the `uaa:scim` section of your deployment manifest for the username and password of an admin user.
2. Log in to your UAA API by running:

```
cf login -u ADMIN-USERNAME -p ADMIN-PASSWORD
```

Where:

- ADMIN-USERNAME is the username of the admin user.
- ADMIN-PASSWORD is the password of the admin user.

3. Create a new user by running:

```
cf create-user NEW-USERNAME NEW-USER-PASSWORD
```

Where:

- NEW-USERNAME is the username you give the new user.
- NEW-USER-PASSWORD is the password you give the new user.

In cf CLI v7+, you can use the `--password-prompt` option to prompt for the password. This enhances security by removing the requirement to type the password on the command line.

## Change passwords

To change the password of a user:

1. Obtain the credentials of the admin client you created in [Create an Admin User](#), or see the `uaa:scim` section of your deployment manifest for the user name and password of an admin user.
2. Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin secret you recorded in the previous step.

UAAC stores the token in `~/.uaac.yml`.

3. Display the users and apps authorized by the UAA server, as well as the permissions granted to each user and app, by running:

```
uaac contexts
```

4. In the output from `uaac contexts`, check the `scope` section of the `client_id: admin` user for `password.write`. The value `password.write` represents sufficient permissions to change passwords.
5. If the admin user lacks permissions to change passwords, add the permissions:

1. Add the necessary permissions to the admin user account on the UAA server by running:

```
uaac client update admin --authorities "EXISTING-PERMISSIONS password.write"
```

Where `EXISTING-PERMISSIONS` is the current contents of the `scope` section from the output from `uaac contexts`.

2. Delete the local token by running:

```
uaac token delete
```

3. Obtain an updated access token from the UAA server by running:

```
uaac token client get admin
```

6. Change an existing user password to a temporary password by running:

```
uaac password set USERNAME -p TEMP-PASSWORD
```

Where:

- `USERNAME` is the username of the user whose password you want to change.
- `TEMP-PASSWORD` is the temporary password you set.

7. Provide the temporary password to the user and instruct the user to run:

```
cf target api.UAA-DOMAIN
cf login -u USERNAME -p TEMP-PASSWORD
cf passwd
```

Where:

- `UAA-DOMAIN` is the domain of your UAA server.
- `USERNAME` is the username of the user.
- `TEMP-PASSWORD` is the temporary password you provided the user.

To configure the password policy, see [Configuring UAA Password Policy](#).

## Retrieve user email addresses

Some Operations Manager components, like Cloud Controller, only use GUIDs for user identification. You can use UAA to retrieve the emails of your Operations Manager instance users either as a list or, for a specific user, with that user's GUID.

1. Target your UAA server by running:

```
uaac target uaa.UAA-DOMAIN
```

Where `UAA-DOMAIN` is the domain of your UAA server.

2. Record the `uaa:admin:client_secret` from your deployment manifest.
3. Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin secret you recorded in the previous step.

UAAC stores the token in `~/.uaac.yml`.

4. Display the users and apps authorized by the UAA server, as well as the permissions granted to each user and app, by running:

```
uaac contexts
```

5. In the output from `uaac contexts`, check the `scope` section of the `client_id: admin` user for `scim.write`. The value `scim.write` represents sufficient permissions to query the UAA server for user information.
6. If the admin user lacks permissions to change passwords, add the permissions:

1. Add the necessary permissions to the admin user account on the UAA server by running:

```
uaac client update admin --authorities "EXISTING-PERMISSIONS scim.write"
```

Where `EXISTING-PERMISSIONS` is the current contents of the `scope` section from the output from `uaac contexts`.

2. Delete the local token by running:

```
uaac token delete
```

3. Obtain an updated access token from the UAA server by running:

```
uaac token client get admin
```

7. To list your Operations Manager instance users, run:

```
uaac users
```

By default, the `uaac users` command returns information about each user account, including GUID, name, permission groups, activity status, and metadata. To limit the output of `uaac users`

to email addresses, run:

```
uaac users --attributes emails
```

8. To retrieve a specific user's email address, run:

```
uaac users "id eq GUID" --attributes emails
```

Where `GUID` is the GUID of a specific user.

## Creating new TAS for VMs user accounts

When you first deploy VMware Tanzu Application Service for VMs (TAS for VMs), there is only one user: an administrator. At this point, you can add accounts for new users who can then push apps using the Cloud Foundry Command Line Interface (cf CLI).

How you add users depends on whether or not you have SMTP activated, as described in the following options:

### Option 1: Adding new users when SMTP is activated

If you have activated SMTP, your users can sign up for accounts and create their own orgs. They do this using the [Operations Manager Apps Manager](#), a self-service tool for managing organizations, users, app, and app spaces.

Complete the following steps to log in and get started using Apps Manager:

1. Browse to `apps.YOUR-SYSTEM-DOMAIN`. See the **Domains** pane in the TAS for VMs tile to locate your system domain.
2. Select **Create an Account**.
3. Enter your email address and click **Create an Account**. When your account is ready, Apps Manager sends you a new account email.
4. When you receive the new account email, follow the link in the email to complete your registration.
5. Select your organization name.

You now have access to the Apps Manager. For more information about using Apps Manager, see the [Apps Manager documentation](#).

### Option 2: Adding new users when SMTP is not activated

If you have not activated SMTP, only an administrator can create new users, and there is no self service facility for users to sign up for accounts or create orgs.

The administrator creates users with the cf CLI. For more information, see [Creating and Managing Users with the cf CLI](#).

## Configuring UAA Password Policy

If your VMware Tanzu Application Service for VMs (TAS for VMs) deployment uses the internal user store for authentication, you can configure its password policy in the TAS for VMs tile.

To open the internal user store (formerly called internal UAA) configuration for your deployment:

1. In a browser, go to the fully qualified domain name (FQDN) of your Tanzu Operations Manager and log in.
2. Click the **TAS for VMs** tile.
3. Select **UAA**.
  - Confirm that the **Configure policies** option is selected.
  - For **Minimum password length**, enter the minimum number of characters for a valid password.
  - For **Require at least one lowercase character**, select if at least 1 lowercase character is required for a valid password.
  - For **Require at least one uppercase character**, select if at least 1 uppercase character is required for a valid password.
  - For **Require at least one numeric character**, select if at least 1 numeric digit is required for a valid password.
  - For **Require at least one special character**, select if at least 1 special character is required for a valid password.
  - For **Maximum password entry attempts allowed**, enter the maximum number of failures allowed to enter a password within a five minute timespan before the account is locked.

### Password policies for UAA internal users\*

- Use default policies
- Configure policies

Minimum password length ( min: 0, max: 32 ) \*

0

Require at least one lowercase character

Require at least one uppercase character

Require at least one numeric character

Require at least one special character

Maximum password entry attempts allowed ( min: 1 ) \*

5

## Adding existing SAML or LDAP users to a TAS for VMs deployment

There are two ways to add existing SAML or LDAP users to a VMware Tanzu Application Service for VMs (TAS for VMs) deployment enabled with SAML or LDAP:

- [Option 1: Import Users in Bulk](#)
- [Option 2: Add Users Manually](#)

## Prerequisites

To perform the procedures in this topic, you must have:

- Admin access to the Tanzu Operations Manager Installation Dashboard for your TAS for VMs deployment
- The [Cloud Foundry Command Line Interface \(cf CLI\)](#) v6.23.0 or later

## Option 1: Import users in bulk

You can import SAML or LDAP users in bulk by using the CF-MGMT Tool. For instructions about installing and using the tool, see [the CF-MGMT README](#).

## Option 2: Add users manually

The following sections describe how to add existing SAML or LDAP users to your TAS for VMs deployment manually.

### Step 1: Create user

To add a SAML or LDAP user:

1. Target the API endpoint for your TAS for VMs deployment by running:

```
cf target https://api.SYSTEM-DOMAIN
```

Where `SYSTEM-DOMAIN` is your system domain.

2. Run:

```
cf login
```

3. Provide credentials for an account with the Admin user role. For more information about the Admin user role, see [Roles and Permissions](#) in *Orgs, Spaces, Roles, and Permissions*.
4. Create the user in UAA by running:

```
cf create-user USERNAME --origin PROVIDER-NAME
```

Where:

- `USERNAME` is the username of the SAML or LDAP user you want to add.
- `PROVIDER-NAME` is `ldap` for an LDAP user, or the name of the SAML provider you entered when you configured Tanzu Operations Manager for a SAML user.

### Step 2: Associate user with org or space role

After creating the SAML or LDAP user, you must associate the user with either an Org or Space role.

For more information about roles, see [Roles and Permissions](#) in *Orgs, Spaces, Roles, and Permissions*.

#### Associate user with org role

To associate the SAML or LDAP user with an Org role:

1. Run:

```
cf set-org-role USERNAME ORG ROLE
```

Where:

- `USERNAME` is the name of the SAML or LDAP user.

- **ORG** is the name of your org.
- For **ROLE**, enter one of the following:
  - **OrgManager**: Org Managers can invite and manage users, select and change plans, and set spending limits.
  - **BillingManager**: Billing Managers can create and manage the billing account and payment information.
  - **OrgAuditor**: Org Auditors have read-only access to Org information and reports.

For example:

```
cf set-org-role j.smith@example.com example-org OrgManager
```

### Associate user with space role

To associate the SAML or LDAP user with a space role:

1. Run:

```
cf set-space-role USERNAME ORG SPACE ROLE
```

Where:

- **USERNAME** is the name of the SAML or LDAP user.
- **ORG** is the name of your org.
- **SPACE** is the name of a space in your org.
- For **ROLE**, enter one of the following:
  - **SpaceManager**: Space Managers can invite and manage users, and enable features for a given Space.
  - **SpaceDeveloper**: Space Developers can create and manage apps and services, and see logs and reports.
  - **SpaceAuditor**: Space Auditors can view logs, reports, and settings on this Space.

For example:

```
cf set-space-role j.smith@example.com example-org example-space SpaceDeveloper
```

## Configuring App Security Groups for email notifications

You can configure App Security Groups (ASGs) to give network access to the Notifications Service.

To allow the Notifications Service to have network access, you must create App Security Groups (ASG). You cannot use the Notifications Service without ASGs.

For more information, see [App Security Groups](#).

## Prerequisite

Before configuring ASGs for the Notifications Service, you must first set up the Notifications Service. To set up the Notifications Service, see [Getting Started with the Notifications Service](#).

## Configure network connections

The Notifications Service is deployed as a suite of apps to the `notifications-with-ui` space in the `system` org. It requires the following outbound network connections:

Destination	Ports	Protocol	Reason
<code>SMTP_SERVER</code>	587 (default)	tcp (default)	This service is used to send out email notifications.
<code>LOAD_BALANCER_IP</code>	80, 443	tcp	This service accesses the load balancer.
<code>ASSIGNED_NETWORK</code>	3306	tcp	This service requires access to internal services. <code>ASSIGNED_NETWORK</code> is the CIDR of the network assigned to this service.

The SMTP server port and protocol are dependent on how you configure your server.

## Create a SMTP server ASG

To create an ASG for your SMTP server:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the VMware Tanzu Application Service for VMs (TAS for VMs) tile.
3. Select **Email Notifications**.
4. Record the values in the **SMTP server address** and **SMTP server port** fields.
5. Using the **SMTP server address** you obtained in the previous step, find the IP addresses and protocol of your SMTP server from the service you are using. You might have to contact your service provider for this information.
6. Create a `smtp-server.json` file. For `destination`, you must enter the IP address of your SMTP Server.

```
[  
  {  
    "protocol": "tcp",  
    "destination": "SMTP_SERVER_IPS",  
    "ports": "587"  
  }  
]
```

7. Create an ASG called `smtp-server` by running:

```
cf create-security-group smtp-server smtp-server.json
```

## Create an assigned network ASG

If you use external services, the IP addresses, ports, and protocols depend on the service.

To create an ASG for an assigned network:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Assign AZs and Networks**.
4. Record the network selected in the **Network** dropdown.
5. Return to the Tanzu Operations Manager Installation Dashboard.
6. Click the BOSH Director tile.
7. Select **Create Networks**.
8. Record the **CIDR** for the network you identified in **Assign AZs and Networks**. Ensure the subnet mask allows the space to access `p-mysql`, `p-rabbitmq`, and `p-redis`.
9. Create a file `assigned-network.json`. For the `destination`, enter the **CIDR** you recorded above.

```
[  
  {  
    "protocol": "tcp",  
    "destination": "10.68.0.0/20",  
    "ports": "3306,5672,6379"  
  }  
]
```

10. Create an ASG called `assigned-network` by running:

```
cf create-security-group assigned-network assigned-network.json
```

## Bind the ASGs

After creating your ASGs, you must bind them to the Notifications Service.

To bind your ASGs to the Notifications Service:

1. Target the `system` org by running:

```
cf target -o system
```

2. Create a `notifications-with-ui` space by running:

```
cf create-space notifications-with-ui
```

3. Bind the ASGs you created in this topic to the `notifications-with-ui` space by running:

```
cf bind-security-group smtp-server system notifications-with-ui  
cf bind-security-group assigned-network system notifications-with-ui
```

## Get started with the Notifications Service in TAS for VMs

You can use the Notifications Service in TAS for VMs to create a client, obtain a token, register notifications, create a custom template, and send notifications.

# Prerequisites

Before you use the Notifications Service you must:

- Install [VMware Tanzu Application Service for VMs](#) (TAS for VMs).
- Have `admin` permissions on your TAS for VMs instance. You also must configure [Configuring App Security Groups for Email Notifications](#).
- Install the [Cloud Foundry Command Line Interface \(cf CLI\)](#) and [User Account and Authorization Server \(UAAC\)](#) command line tools.

## Create a client and get a token

To interact with the Notifications Service, you must create UAA scopes.

To create UAA scopes:

1. Target your UAA server by running:

```
uaac target uaa.YOUR-DOMAIN
```

Where `YOUR-DOMAIN` is the domain of your UAA server URL.

2. Record the **Admin Client Credentials** from the **UAA** row in the TAS for VMs **Credentials** tab.
3. Authenticate and obtain an access token for the admin client from the UAA server by running:

```
uaac token client get admin -s ADMIN-CLIENT-SECRET
```

Where `ADMIN-CLIENT-SECRET` is the admin client secret.

UAAC stores the token in `~/.uaac.yml`.

4. Create a `notifications-admin` client with the required scopes by running:

```
uaac client add notifications-admin --authorized_grant_types client_credentials
--authorities \
  notifications.manage,notifications.write,notification_templates.write,notification_templates.read,critical_notifications.write
```

- `notifications.write`: Send a notification. For example, you can send notifications to a user, space, or everyone in the system.
- `notifications.manage`: Update notifications and assign templates for that notification.
- (Optional) `notification_templates.write`: Create a custom template for a notification.
- (Optional) `notification_templates.read`: Check which templates are saved in the database.

5. Log in using your newly created client by running:

```
uaac token client get notifications-admin
```

Stay logged in to this client to follow the examples in this topic.

For more information about UAA scopes, see [User Account and Authentication \(UAA\) Server](#).

## Register notifications



To register notifications, you must have the `notifications.manage` scope on the client. To set critical notifications, you must have the `critical_notifications.write` scope.

You must register a notification before sending it. Using the token `notifications-admin` from the previous step, the following example registers two notifications with the following properties:

```
uaac curl https://notifications.user.example.com/notifications -X PUT --data '{
  "source_name": "Cloud Ops Team",
  "notifications": {
    "system-going-down": { "critical": true, "description": "Cloud going down" },
    "system-up": { "critical": true, "description": "Cloud back up" }
  }
}'
```

- `source_name` has “Cloud Ops Team” set as the description.
- `system-going-down` and `system-up` are the notifications set.
- `system-going-down` and `system-up` are made `critical`, so no users can unsubscribe from that notification.

## Create a custom template

To view a list of templates, you must have the `notifications_templates.read` scope. To create a custom template, you must have the `notification_templates.write` scope.

A template is made up of a name, a subject, a text representation of the template you are sending for mail clients that do not support HTML, and an HTML version of the template.

The system provides a default template for all notifications, but you can create a custom template by running:

```
uaac curl https://notifications.user.example.com/templates -X POST --data \
'{"name":"site-maintenance","subject":"Maintenance: {{.Subject}}","text":"The site has
gone down for maintenance. More information to follow {{.Text}}","html":"<p>The site h
as gone down for maintenance. More information to follow {{.HTML}}</p>"}'
```

Variables that take the form `{{.}}` interpolate data provided in the send step before a notification is sent.

Data that you can insert into a template during the send step include `{{.Text}}`, `{{.HTML}}`, and `{{.Subject}}`.

This `curl` command returns a unique template ID that can be used in subsequent calls to refer to your custom template. The result looks similar to:

```
{"template-id": "E3710280-954B-4147-B7E2-AF5BF62772B5"}
```

Check all of your saved templates by running:

```
uaac curl https://notifications.user.example.com/templates -X GET
```

## Associate a custom template with a notification

In this example, the `system-going-down` notification belonging to the `notifications-admin` client is associated with the template ID `E3710280-954B-4147-B7E2-AF5BF62772B5`. This is the template ID of the template we created in the previous section.

Associating a template with a notification requires the `notifications.manage` scope.

```
uaac curl https://notifications.user.example.com/clients/notifications-admin/notifications/system-going-down/template \
-X PUT --data '{"template": "E3710280-954B-4147-B7E2-AF5BF62772B5"}'
```

Any notification that does not have a custom template applied, such as `system-up`, defaults to a system-provided template.

## Send a notification



To send a critical notification, you must have the `critical_notifications.write` scope.  
To send a non-critical notification, you must have the `notifications_write` scope.

You can send a notification to the following recipients:

- A user
- A space
- An org
- All users in the system
- A UAA scope
- An email address

For more information, see [Notifications V1 Documentation](#) in the Notifications repository on GitHub.

The following example command sends the `system-going-down` notification described above to all users in the system:

```
uaac curl https://notifications.user.example.com/everyone -X POST --data \
'{"kind_id": "system-going-down", "text": "The system is going down while we upgrade our storage", "html": "<strong>THE SYSTEM IS DOWN</strong><p>The system is going down while we upgrade our storage</p>", "subject": "Upgrade to Storage", "reply_to": "no-reply@example.com"}'
```

## UAA

In this section:

- [User Account and Authentication server](#)

- [User Account and Authentication concepts](#)
- [Identity providers in UAA](#)
- [UAA performance metrics](#)

## User Account and Authentication server

This topic tells you about the User Account and Authentication (UAA) Server, the identity management service for VMware Tanzu Application Service for VMs (TAS for VMs).

The primary role of UAA is as an OAuth2 provider, that issues tokens for client apps to use when they act on behalf of TAS for VMs users. In collaboration with the login server, UAA can authenticate users with their TAS for VMs credentials, and can act as an SSO service using those, or other, credentials.

UAA has endpoints for managing user accounts, registering OAuth2 clients, and various other management functions.

Different runtimes and services use separate UAA instances. TAS for VMs has two UAA instances by default: one for BOSH Director, used to bootstrap the rest of the TAS for VMs deployment; and one for the BOSH deployment, used as a shared resource by all apps that require user authentication. This is the minimum number of UAA instances TAS for VMs must have. Other runtimes and services also have UAA instances. These instances are separate from each other. If you log into one runtime or service, you are not also logged into other runtimes and services that authenticate using UAA. You must log in to each runtime or service separately.

You can deploy UAA locally or to TAS for VMs.

## Deploying UAA locally

To deploy and run UAA locally:

1. In a terminal window, clone the UAA GitHub repository by running:

```
git clone git://github.com/cloudfoundry/uaa.git
```

2. Go to the directory where you cloned the UAA GitHub repository.
3. To build and run all the components that comprise UAA and the example programs `uaa`, `samples/api`, and `samples/app`, run:

```
./gradlew run
```

4. If successful, the three apps run together on a single instance of Tomcat listening on port 8080, with endpoints `/uaa`, `/app`, and `/api`. Tomcat is a library of Java code used by UAA to create its features. For more information, see the [Apache Tomcat](#) website.

## Using local UAA

To access and use a locally deployed UAA server:

1. Run the UAA server as described in [Deploy Locally](#).

- Open another terminal window. From the project base directory, run `curl localhost:8080/uaa/info -H "Accept: application/json"` to confirm the UAA is running. You can see basic information about the system. For example:

```
$ curl localhost:8080/uaa/info -H "Accept: application/json"
{
  "app": {
    "version": "4.19.0"
  },
  "links": {
    "uaa": "http://localhost:8080/uaa",
    "passwd": "/forgot_password",
    "login": "http://localhost:8080/uaa",
    "register": "/create_account"
  },
  "zone_name": "uaa",
  "entityID": "cloudfoundry-saml-login",
  "commit_id": "af93628",
  "idpDefinitions": {},
  "prompts": {
    "username": [
      "text",
      "Email"
    ],
    "password": [
      "password",
      "Password"
    ]
  },
  "timestamp": "2018-05-25T15:34:31-0700"
}
```

- To install the TAS for VMs UAA Command Line Client (UAAC) Ruby gem, run:

```
gem install cf-uaac
```

- To target the local UAA server endpoint, run:

```
uaac target http://localhost:8080/uaa
```

- Run `uaac token client get CLIENT_NAME -s CLIENT_SECRET` to obtain an access token. Replace `CLIENT_NAME` and `CLIENT_SECRET` with actual values. For example, when starting up the UAA locally for development, you must have a predefined admin client to use:

```
uaac token client get admin -s adminsecret
```

If you run the command without `-s CLIENT_SECRET`, UAAC shows an interactive prompt where you must create the client secret value. The `uaac token client get` command requests an access token from the server using the OAuth2 client credentials grant type. For more information about the OAuth2 client credentials, see [Client Credentials](#) in the OAuth 2.0 Authorization Framework.

- View your UAAC token context. When UAAC obtains a token, the token and other metadata is stored in the `~/.uaac.yml` file on your local machine. To view the token you have obtained, run `uaac context`. For example:

```
$ uaac context
[0]*[http://localhost:8080/uaa]

[0]*[admin]
  client_id: admin
  access_token: eyJhbGciOiJIUzI1NiIsImtpZCI6ImxlZ2FjeS10b2tibi1rZXkiLCJ
  0eXAi0iJKV1QifQ.eyJqdGkiOiIx0WYyNWU2Y2E5Y2M0ZWIyYTdmNTAxNmU0NDFjZThkNCI
  sInN1YiI6ImFkbWluIiwiYXV0aG9yaXRpZXMi0lsiY2xpZW50cy5yZWFkIiwiY2xpZW50cy
  5zZWNyZXQiLCJjbGllbnRzLndyaXRlIiwidWFhLmFkbWluIiwiY2xpZW50cy5hZG1pbisI
  nNjaW0ud3JpdGUiLCJzY2ltLnJlYWQiXSic2NvcGUI0lsiY2xpZW50cy5yZWFkIiwiY2xp
  ZW50cy5zZWNyZXQiLCJjbGllbnRzLndyaXRlIiwidWFhLmFkbWluIiwiY2xpZW50cy5hZG1
  pbisInNjaW0ud3JpdGUiLCJzY2ltLnJlYWQiXSic2NvcGUI0lsiY2xpZW50X2lkIjoiYWRtaW4iLCJjaW
  Qi0iJhZG1pbisImF6cCI6ImFkbWluIiwiZ3JhbnRfdHlwZSI6ImNsawVudF9jcmVkZW50a
  WFscyIsInJldl9zaWci0iIyNjcx0TlkMSIsImlhdCI6MTUy0DIzMjAxNywiZxhwIjoxNTI4
  Mjc1MjE3LCJpc3Mi0iJodHRw0i8vbG9jYWxob3N00jgw0DAvdWFhL29hdXRoL3Rva2VuIi
  iemlkIjoidWFhIiwiYXV0IjpbInNjaW0iLCJjbGllbnRzIiwidWFhIiwiYWRtaW4iXX0.L2
  cn6HqLQAEyqTrYYkL9Al_8JyfwB330er7DshUb9wg
  token_type: bearer
  expires_in: 43199
  scope: clients.read clients.secret clients.write uaa.admin clients.ad
  min scim.write scim.read
  jti: 19f25e6ca9cc4eb2a7f5016e441ce8d4
```

Copy the access token from this output for the next step.

- Run `uaac token decode ACCESS-TOKEN-VALUE` to view information in the token, which is encoded using the JSON Web Token (JWT) format. Replace `ACCESS-TOKEN-VALUE` with your access token, copied from the `uaac context` output. The UAAC displays all the claims inside the token body. For example:

```
$ uaac token decode eyJhbGciOiJIUzI1NiIsImtpZCI6ImxlZ2FjeS10b2tibi1rZXk
  iLCJ0eXAi0iJKV1QifQ.eyJqdGkiOiIx0WYyNWU2Y2E5Y2M0ZWIyYTdmNTAxNmU0NDFjZTh
  kNCIsInN1YiI6ImFkbWluIiwiYXV0aG9yaXRpZXMi0lsiY2xpZW50cy5yZWFkIiwiY2xpZW
  50cy5zZWNyZXQiLCJjbGllbnRzLndyaXRlIiwidWFhLmFkbWluIiwiY2xpZW50cy5hZG1pb
  iisInNjaW0ud3JpdGUiLCJzY2ltLnJlYWQiXSic2NvcGUI0lsiY2xpZW50cy5yZWFkIiwiY2xpZW50cy5
  hZG1pbisInNjaW0ud3JpdGUiLCJzY2ltLnJlYWQiXSic2NvcGUI0lsiY2xpZW50X2lkIjoiYWRtaW4iLC
  JjaWQi0iJhZG1pbisImF6cCI6ImFkbWluIiwiZ3JhbnRfdHlwZSI6ImNsawVudF9jcmVkZW50a
  WFscyIsInJldl9zaWci0iIyNjcx0TlkMSIsImlhdCI6MTUy0DIzMjAxNywiZxhwIjoxNTI4Mjc1MjE3LCJpc3Mi0iJodHRw0i8vbG9jYWxob3N00jgw0DAvdWFhL29hdXRoL3Rva2VuIi
  iemlkIjoidWFhIiwiYXV0IjpbInNjaW0iLCJjbGllbnRzIiwidWFhIiwiYWRtaW4iXX0.L2
  cn6HqLQAEyqTrYYkL9Al_8JyfwB330er7DshUb9wg
```

Note: no key given to validate token signature

```
jti: 19f25e6ca9cc4eb2a7f5016e441ce8d4
sub: admin
```

```

authorities: clients.read clients.secret clients.write uaa.admin clients.admin scim.write scim.read
scope: clients.read clients.secret clients.write uaa.admin clients.admin scim.write scim.read
client_id: admin
cid: admin
azp: admin
grant_type: client_credentials
rev_sig: 267199d1
iat: 1528232017
exp: 1528275217
iss: http://localhost:8080/uaa/oauth/token
zid: uaa
aud: scim clients uaa admin

```

## Deploying UAA to TAS for VMs

To build the UAA as an app and push it to TAS for VMs using the Cloud Foundry Command Line Interface (cf CLI):

1. Clone the UAA GitHub repository by running:

```
git clone git://github.com/cloudfoundry/uaa.git
```

2. Go to the directory where you cloned the UAA GitHub repository.
3. Build the UAA as a WAR file by running:

```
./gradlew :cloudfoundry-identity-uaa:war
```

4. Run the cf CLI `cf push APP-NAME -m 512M -p PATH-TO-WAR-FILE --no-start` command to push the app to TAS for VMs. Replace `APP-NAME` with a name for your UAA app, and `PATH-TO-WAR-FILE` with the path to the WAR file you created in the previous step. For example:

```
cf push MYUAA -m 512M -p uaa/build/libs/cloudfoundry-identity-uaa-1.8.0.war --no-start
```

5. Run `cf set-env APP-NAME SPRING_PROFILES_ACTIVE default` to set the `SPRING_PROFILES_ACTIVE` environment variable with the value `default`. Replace `APP-NAME` with the name of your app that you used in the previous step. For example:

```
cf set-env MYUAA SPRING_PROFILES_ACTIVE default
```

6. Run `cf start APP-NAME` to start your app. Replace `APP-NAME` with the name of your app. For example:

```
cf start MYUAA
```

## Using remote UAA

You use a UAA server that you pushed as an app to TAS for VMs in a similar way to one you run locally. You do not need app token encoding because you do not have the client secret.

To access and use a UAA server that you pushed as an app to TAS for VMs:

1. Follow the procedure in [Deploy UAA to TAS for VMs](#).
2. From the project base directory, run `curl -H "Accept: application/json" APP-FQDN/login` to query the external login endpoint about the system. Replace `APP-FQDN` with the fully qualified domain name (FQDN) of your app. For example:

```
$ curl -H "Accept: application/json" uaa.example.org/login
{
  "timestamp": "2014-09-15T18:25:04+0000",
  "app": {"version": "1.8.3"},
  "commit_id": "git-metadata-not-found",
  "prompts": {"username": ["text", "Email"], "password": ["password", "Password"]}
}
```

3. Install the UAA Command Line Client (UAAC) Ruby gem by running:

```
gem install cf-uaac
```

4. Target the remote UAA Server endpoint by running:

```
uaac target APP-FQDN
```

Where `APP-FQDN` is the FQDN of your app.

5. Log in by running:

```
uaac token get USERNAME PASSWORD
```

Where:

- `USERNAME` is your username.
- `PASSWORD` is your password. If you do not specify a username and password, the UAAC prompts you to supply them.

The `uaac token client get` command authenticates and obtains an access token from the server using the OAuth2 implicit grant, similar to the approach intended for a standalone client like the cf CLI.

## Running integration tests

When you run integration tests, it makes sure that the UAA instance is running properly.

To run integrations tests:

```
./gradlew integrationTest
```

This command starts a UAA server running in a local Apache Tomcat instance. By default, the service URL is set to `http://localhost:8080/uaa`.

You can set the environment variable `CLOUD_FOUNDRY_CONFIG_PATH` to a directory containing a `uaa.yml` file where you change the URLs used in the tests, and where you can set the UAA server context root.

## Customizing your YAML configuration

A custom YAML configuration gives integration tests access to your UAA instance by sharing credentials in YAML file.

To create a custom YAML configuration:

1. Create a `uaa.yml` file in the following format:

```
uaa:
  host: UAA-HOSTNAME
  test:
    username: USERNAME
    password: PASSWORD
    email: EMAIL-ADDRESS
```

Where:

- `UAA-HOSTNAME` is the FQDN of UAA app. For example, `uaa.example.org`.
- `USERNAME` is a valid username. For example, `dev@example.org`.
- `PASSWORD` is the password for the previous username.
- `EMAIL-ADDRESS` is the email address for the previous user. Example: `dev@example.org`.

2. From the `uaa/uaa` directory, run:

```
CLOUD_FOUNDRY_CONFIG_PATH=/tmp ./gradlew test
```

The web app looks for a YAML file in the following locations when it starts, with later entries overriding earlier ones:

```
classpath:uaa.yml
file:${CLOUD_FOUNDRY_CONFIG_PATH}/uaa.yml
file:${UAACONFIGFILE}
${UAACONFIGURL}
```

## Testing with PostgreSQL or MySQL

The default UAA unit tests, `./gradlew test`, use a HyperSQL database.

To use a different database management system:

1. Create a `uaa.yml` file containing `spring_profiles: default,OTHER-DBMS` in the `src/main/resources/` directory. Replace `OTHER-DBMS` with the name of the other database management system to use.
2. Run the unit tests using your specified database management system instead of a HyperSQL database:

```
echo "spring_profiles: default,OTHER-DBMS" > src/main/resources/uaa.yml
./gradlew test integrationTest
```

Where `OTHER-DBMS` is the name of the database management system you specified in your `uaa.yml` file.

You can find the database configuration for the common and scim modules at `common/src/test/resources/(mysql|postgresql).properties` and `scim/src/test/resources/(mysql|postgresql).properties`.

## UAA projects

The following UAA projects exist:

- `common`: A module containing a JAR with all the business logic. `common` is used in the web apps.
- `uaa`: The UAA server. `uaa` provides an authentication service and authorized delegation for back-end services and apps by issuing OAuth2 access tokens.
- `api`: A sample OAuth2 resource service that returns a mock list of deployed apps. `api` provides resources that other apps might want to access on behalf of the resource owner.
- `app`: A sample user app that uses both `api` and `uaa`. `app` is a web app that requires single sign-on and access to the `api` service on behalf of users.
- `scim`: The System for Cross-domain Identity Management (SCIM) user management module used by UAA. For more information about SCIM, see [Managing Users & Groups with SCIM](#).

## UAA server

The authentication service, `uaa`, is a Spring MVC web app. You can deploy it in Tomcat or your container of choice, or run `./gradlew run` to run it directly from the `uaa` directory in the source tree. When run with Gradle, `uaa` listens on port 8080 and has the URL `http://localhost:8080/uaa`.

The UAA server supports the APIs defined in the UAA-APIs document which include:

- The OAuth2 `/authorize` and `/token` endpoints.
- A `/login_info` endpoint to allow querying for required login prompts.
- An `/introspect` endpoint to allow resource servers to obtain information about an access token submitted by an OAuth2 client.
- A SCIM user-provisioning endpoint.
- OpenID Connect endpoints `/userinfo` and `/check_id` to support authentication.

Command-line clients can perform authentication by submitting credentials directly to the `/authorize` endpoint.

An `ImplicitAccessTokenProvider` exists in Spring Security OAuth to use if your client is Java.

By default, `uaa` runs with a context root `/uaa`.

## Configuration

A `uaa.yml` file exists in the app. This file provides defaults to the placeholders in the Spring XML.

You can override any occurrences of  `${placeholder.name}` in the XML by adding it to your `uaa.yml` file, or by providing a System property with the same name, `-D`, to your Java virtual machine.

All passwords and client secrets in the configuration files are in plain text, but are inserted into the UAA database encrypted with BCrypt.

### User account data

The default uses an in-memory relational database management system (RDBMS) user store, pre-populated with a single test user `marissa` with the password `koala`.

To use PostgreSQL for user data, you must activate the Spring profile `postgresql`.

You can configure the active profiles in your `uaa.yml` file using `spring_profiles: postgresql,default`.

To use PostgreSQL instead of HyperSQL, run:

```
echo "spring_profiles: postgresql,default" > src/main/resources/uaa.yml
./gradlew run
```

To bootstrap a microcloud-type environment, you need an admin client. During the bootstrapping process, the database creates a database initializer component that inserts an admin client.

If the default profile is active, the bootstrapping process creates a cf CLI client so that the Gem login works with no additional configuration required. You can override the default settings and add additional clients in the `uaa.yml` file, as in the following example:

```
oauth:
  clients:
    admin:
      authorized-grant-types: client_credentials
      scope: read,write,password
      authorities: ROLE_CLIENT,ROLE_ADMIN
      id: admin
      secret: adminclientsecret
      resource-ids: clients
```

You can use the admin client to create additional clients. You must have a client with read/write access to the `scim` resource to create user accounts. The integration tests handle this automatically by inserting client and user accounts as necessary for the tests.

## Sample apps

Two sample apps are included with UAA: `/api` and `/app`.

You can run `/api` and `/app` with `./gradlew run` from the `uaa` root directory. All three apps, `/uaa`, `/api`, and `/app`, are simultaneously deployed.

### API sample app

The `api` sample app is an example resource server. It hosts a service that returns a list of mock apps under `/apps`.

## App sample app

The `app` sample app is a user interface app, primarily aimed at browsers, that uses OpenID Connect for authentication and OAuth2 for access grants. `app` authenticates with the Auth service, then accesses resources in the API service. You can run `app` with `./gradlew run` from the `uaa` root directory.

The app can operate in multiple different profiles according to the location and presence of the UAA server and the login app. By default, the app looks for a UAA on `localhost:8080/uaa`, but you can change this by setting the `UAA_PROFILE` environment variable or System Property.

The app source code, `samples/app/src/main/resources`, contains multiple properties files pre-configured with different likely locations for those servers. The names of these properties files follow the format `app-UAA_PROFILE.properties`.

The naming convention for the `UAA_PROFILE` is:

- `local`: a localhost deployment
- `vcap`: a `vcap.me` deployment
- `staging`: a staging deployment

Profile names can be hyphenated to indicate multiple contexts. For example, `local-vcap` can be used when the login server is in a different location than the UAA server.

To see all apps, run:

```
GET /app/apps
```

The browser is redirected through a series of authentication and access grant steps.

To see the currently logged-in user details and a selection of attributes from the OpenID provider, run:

```
GET /app
```

## Login app

The `login` app is a user interface for authentication. UAA can also authenticate user accounts, but only if it manages them itself and it only provides a basic UI. You can brand and customize the login app for non-native authentication and for more complicated UI flows, like user registration and password reset.

The log in app is itself an OAuth2 endpoint provider, but delegates those features to the UAA server. Therefore, configuration for the log in app consists of locating the UAA through its OAuth2 endpoint URLs and registering the log in app itself as a client of the UAA. The UAA locations have a `login.yml` file. For example, a local `vcap` instance:

```
uaa:
  url: http://uaa.vcap.example.net
  token:
    url: http://uaa.vcap.example.net/oauth/token
  login:
    url: http://uaa.vcap.example.net/login.do
```

You can define the environment variable or Java System property `login_secret` to use a client secret that the app uses when it authenticates itself with UAA. The `login` app is registered by default in UAA only if there are no active Spring profiles. In UAA, the registration is located in the `oauth-clients.xml` config file, as in the following example:

```
id: login
secret: loginsecret
authorized-grant-types: client_credentials
authorities: ROLE_LOGIN
resource-ids: oauth
```

To authenticate with the `login` app, run:

```
GET /login
```

The sample app presents a form log-in interface for the back end UAA, and an OpenID widget where a user can authenticate using Google or other credentials.

To approve an OAuth2 token grant, run:

```
GET /oauth/authorize?client_id=app&response_type=code...
```

This is the standard OAuth2 authorization endpoint. UAA handles client credentials and all other features in the back end, and the `login` app is used to render the UI.

To obtain the access token, run:

```
POST /oauth/token
```

This is the standard OAuth2 authorization endpoint passed through to UAA.

## Scopes

UAA covers multiple scopes of privilege, and has access to UAA, Cloud Controller, and to the router. For more information about UAA, see [OAuth Scopes](#).

### UAA scopes

The following table describes the scopes of privilege in UAA.

Scope	Description
<code>uaa.user</code>	This scope indicates that this is a user. It is required in the token if submitting a GET request to the OAuth 2 <code>/authorize</code> endpoint.
<code>uaa.none</code>	This scope indicates that this client will not be performing actions on behalf of a user.
<code>uaa.admin</code>	This scope indicates that this is the superuser.
<code>scim.write</code>	This scope gives admin write access to all SCIM endpoints, <code>/Users</code> , and <code>/Groups</code> .
<code>scim.read</code>	This scope gives admin read access to all SCIM endpoints, <code>/Users</code> , and <code>/Groups</code> .
<code>scim.create</code>	This scope gives the ability to create a user with a POST request to the <code>/Users</code> endpoint, but not to modify, read, or delete users.

Scope	Description
scim.userids	This scope is required to convert a username and origin into a user ID and vice versa.
scim.invite	This scope is required to participate in invitations using the <code>/invite_users</code> endpoint.
groups.update	This scope gives the ability to update a group. This ability can also be provided by the broader <code>scim.write</code> scope.
password.write	This admin scope gives the ability to change a user's password.
openid	This scope is required to access the <code>/userinfo</code> endpoint. It is intended for OpenID clients.
idps.read	This scope gives read access to retrieve identity providers from the <code>/identity-providers</code> endpoint.
idps.write	This scope gives the ability to create and update identity providers from the <code>/identity-providers</code> endpoint.
clients.admin	This scope gives the ability to create, modify, and delete clients.
clients.write	This scope is required to create and modify clients. The scopes are prefixed with the scope holder's client ID. For example, <code>id:testclient authorities:client.write</code> gives the ability to create a client that has scopes with the <code>testclient.</code> prefix. Authorities are limited to <code>uaa.resource</code> .
clients.read	This scope gives the ability to read information about clients.
clients.secret	This admin scope is required to change the password of a client.
zones.read	This scope is required to run the <code>/identity-zones</code> endpoint to read identity zones.
zones.write	This scope is required to run the <code>/identity-zones</code> endpoint to create and update identity zones.
scim.zones	This is a limited scope that only allows adding a user to, or removing a user from, zone management groups under the path <code>/Groups/zones</code> .
oauth.approval	<code>/approvals</code> endpoint. This scope is required to approve or reject clients to act on a user's behalf. This is a default scope defined in the <code>uaa.yml</code> file.
oauth.login	This scope is used to indicate a login app, such as external login servers, can perform trusted operations, such as creating users not authenticated in the UAA.
approvals.me	This scope is not currently used.
uaa.resource	This scope indicates that this is a resource server, used for the <code>/introspect</code> endpoint.
zones.ZONE-ID.admin	This scope permits operations in a designated zone, such as creating identity providers or clients in another zone, by authenticating against the default zone. This scope is used with the <code>X-Identity-Zone-Id</code> header.
zones.ZONE-ID.read	This scope permits reading the given identity zone. This scope is used with the <code>X-Identity-Zone-Id</code> header.
zones.ZONE-ID.clients.admin	This scope translates into <code>clients.admin</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.
zones.ZONE-ID.clients.read	This scope translates into <code>clients.read</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.

Scope	Description
<code>zones.ZONE-ID.clients.wri</code>	This scope translates into <code>clients.write</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.
<code>zones.ZONE-ID.clients.sci.m.read</code>	This scope translates into <code>scim.read</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.
<code>zones.ZONE-ID.clients.sci.m.create</code>	This scope translates into <code>scim.create</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.
<code>zones.ZONE-ID.clients.sci.m.write</code>	This scope translates into <code>scim.write</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.
<code>zones.ZONE-ID.idps.read</code>	This scope translates into <code>idps.read</code> after zone switch completes. This scope is used with the <code>X-Identity-Zone-Id</code> header.

## Cloud Controller scopes

The following table describes the scopes of privilege in Cloud Controller.

Scope	Description
<code>cloud_controller.read</code>	This scope gives the ability to read from any Cloud Controller route the token has access to.
<code>cloud_controller.write</code>	This scope gives the ability to post to Cloud Controller routes the token has access to.
<code>cloud_controller.admin</code>	This admin scope gives full permissions to Cloud Controller.
<code>cloud_controller.admin_read_only</code>	This admin scope gives read permissions to Cloud Controller.
<code>cloud_controller.global_auditor</code>	This scope gives read-only access to all Cloud Controller API resources except for secrets such as environment variables.

## Routing scopes

The following table describes the scopes of privilege in the router.

Scope	Description
<code>routing.routes.read</code>	This scope gives the ability to read the full routing table from the router.
<code>routing.routes.write</code>	This scope gives the ability to write the full routing table from the router.
<code>routing.router_groups.read</code>	This scope gives the ability to read the full list of routing groups.
<code>routing.router_groups.write</code>	This scope gives the ability to write the full list of routing groups.

## Scopes of privilege

The following table describes the scopes of privilege in other TAS for VMs services.

Scope	Description
<code>doppler.firehose</code>	This scope gives the ability to read logs from the <a href="#">How the Loggregator Firehose forwards Logs and Metrics</a> endpoint.
<code>notifications.write</code>	This scope gives the ability to send notifications through the <a href="#">Getting started with the Notifications Service</a> .

## User Accounts and Authentication concepts

There are six main components of the Cloud Foundry User Accounts and Authentication (UAA) architecture:

- [Identity zones](#)
- [Subdomains](#)
- [Users](#)
- [User groups](#)
- [Client](#)
- [Choosing scopes and authorities](#)

## Identity zones

UAA is built to support a multi-tenant architecture. Each tenant is referred to as an *identity zone*.

Identity zones are configured with JSON payloads using a REST API. For examples, see [Creating an identity zone](#) in the UAA API documentation.

An identity zone is a logical boundary around the entities UAA manages. The entities in a zone include, but are not limited to:

- Client registrations
- Users
- Groups
- Group mappings
- User approvals
- Identity providers (IDPs) and access
- ID and refresh tokens

Having two identity zones is equivalent to standing up two separate UAA deployments, but using fewer resources. This type of resource management can reduce operational and maintenance overhead.

## Subdomains

An identity zone is uniquely identified by a subdomain identifier in UAA. If a UAA deployment is hosted on the URL `https://login.EXAMPLE-CF-DOMAIN.com`, identity zones are hosted as *subdomains* of that same deployment.

For example:

- zone1: `https://ZONE1.login.EXAMPLE-CF-DOMAIN.com`
- zone2: `https://ZONE2.login.EXAMPLE-CF-DOMAIN.com`

## Default zones

A UAA deployment always has one zone referred to as the *default zone*. You configure and bootstrap a default zone using a YAML configuration file.

## Users

A *user* is the central domain object of the UAA server. Because UAA acts as both an account store and an authorization server, many different types of information are linked to users and can be accessed through user-centric API calls.

In its capacity as a user account store, UAA can provide unique attributes that describe an individual user, such as email, name, phone number, and group memberships. In addition to these attributes, UAA also tracks some dynamic user metadata, such as the last successful logon time and last updated time.

You can make additional attributes available if UAA is configured to use custom attribute mappings from an external IDP, such as an existing LDAP or SAML provider. For more information about IDP options, see [Identity Providers in UAA](#).

External IDPs are read-only, as are attributes from those providers. Any change to the external user account can be performed on the external IDP directly. These read-only attributes are refreshed each time the user authenticates with the external IDP.

UAA can be used as an authorization server, which allows client apps to interact with resources on a user's behalf using the four standard OAuth2 authorization grant flows for obtaining access tokens:

- Authorization code
- Implicit
- Resource owner password credentials
- Client credentials

A UAA user is the *resource owner* of the OAuth2 protocol. Access tokens issued to the user contain scopes at the intersection of the requesting client's allowed scopes and a user's group memberships.

### `user.id`

A `user.id` is a string used to identify a user in APIs. This universally unique identifier is randomly generated at the time of user creation and does not change. It is guaranteed to be unique across all identity zones in the UAA deployment. The `user.id` is a 128-bit number formatted as a UUID. This is also expressed as a “sub” claim in the tokens generated by UAA.

### `user.origin`

A user in UAA always belongs to a user store with an alias called an `origin`. For example, users that are authenticated by the UAA itself with a username and password have their origin set to the value `uaa`.

The fixed origin values are:

- `uaa` for users that are authenticated by the UAA deployment

- `ldap` for users that are authenticated by the LDAP provider
- {OIDC provider alias} for users authenticated through an OIDC provider
- {SAML provider alias} for users authenticated through a SAML IDP

Users that are authenticated with an external IDP are often referred to as shadow users in UAA. For more information, see [Shadow Users](#).

## user.userName

A `user.userName` is a user-readable string that refers to the user, typically an email address. The user enters their username when authenticating against UAA.

If the user authenticates against an external IDP, the username is transferred from that IDP to the shadow user in UAA. An individual user can be uniquely identified by the combination of the username and the origin values.

The username alone is not a unique value. Because usernames can change, UAA provides user IDs as unchanging references to a single user. For more information, see [user.id](#).

Users that create accounts through the UAA UI use their email address as their username. The administrative API can create user accounts that specify arbitrary usernames.

For external IDPs, the username is mapped from the assertion received by UAA.

- **SAML:** UAA retrieve the username from the `nameID` claim. For example:

```
<saml2:NameID> Format="urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified">
  SAML-USERNAME
</saml2:NameID>
```

Where `SAML-USERNAME` is the username UAA retrieves.

- **LDAP:** UAA derives the username from user input.
- **OIDC1.0/OAuth2:** UAA derives usernames from OpenID Connect and OAuth2 providers from the `id_token`, userinfo endpoint, or the access token. The usernames are returned in JSON Web Token (JWT) format. The name of the claim holding the username value can be configured and defaults to `preferred_username`.

## User groups

A user can belong to one or more groups. A group is a way to express a common group-based or role-based access control model. A group has a display name. This name is an arbitrary string that corresponds directly to a scope in a JWT access token and is used for access control by OAuth2 resource servers.

The common group attributes are:

- `type`: This can be one of two membership types, `DIRECT` and `INDIRECT`. `DIRECT` means that the user is directly associated with the group. `INDIRECT` means that the membership has been inherited from the nested membership of groups.
- `display`: The `displayName` of the group the user or the group belongs to. The `displayName` is an identifier that is unique to a given identity zone and is a representation of the access given to the user.

To create a group, see [Groups](#) in the UAA API documentation. To add a user or group to a group, see [Add Member](#) in the UAA API documentation.

## Default user groups

You can configure UAA to have one or more default groups. These are groups that every user in the system is a member of, even if there is no direct relationship between user and group in the database.

## Shadow users

Users that have authenticated through an external IDP still get assigned a record in the users table in the UAA database. These users are frequently called *shadow users*.

UAA internal users have a `user.origin` of `uaa`. Shadow users are differentiated from internal users with a different origin corresponding to the external IDP. Each time an external user is authenticated and the assertion is passed to UAA, UAA refreshes the user information. This means that the information about a shadow user in UAA is accurate up to the last time UAA received an assertion with user information.

Shadow users have a different type of group membership. A shadow user can be associated with a group through its origin. This membership may also change each time a new assertion is received.

A shadow user can also have a group membership defined using `group_membership.origin='uaa'`. These are memberships that remain persistent and do not change when assertions report a change in external group memberships. It also allows UAA operators to assign privileges to users that are not known by external providers or cannot be mapped to external groups.

## Client

UAA is an OAuth2 authorization server. Before apps can obtain access tokens, developers must perform a one-time registration process to create a *client* in the UAA.

A client usually represents an app with its own set of permissions and configurations. Clients are protected by simple credentials, such as client ID and secret, that apps use to authenticate themselves to the UAA in order to obtain tokens.

There are two types of clients:

- Clients that access resources and request tokens from UAA with which to do so
- Clients that represent resources and accept and validate access tokens

Clients are created in UAA through *client registration*. You can define clients in UAA using the UAA configuration files or create them using the UAA API.

## Choosing authorization grant types

To create a client, the developer must specify which grant types should be permitted using their client. The grant type determines how your client can interact with UAA. Each grant type corresponds to one of the four different authorization flows defined in the OAuth2 2.0 Authorization Framework. For more information, see the [Authorization Code](#) section of the OAuth2 2.0 Authorization Framework.

The available grant types on UAA include:

- `authorization_code`

- `password`
- `implicit`
- `client_credentials`

For increased security, use only the grant types your app requires. However, you can assign multiple grant types to one client if necessary.

## Selecting the client grant type

To help you choose a grant type for your use case, see the following table:

Grant type	User	Details
<code>authorization_code</code>	Developers building web apps	In the authorization code grant flow, the user is directed to a UAA page where they grant approvals to the client. After the user approves the requested scopes, they are redirected back to the client app with an authorization code in the URL parameters. The client app may then exchange the authorization code with UAA to obtain an access token.
<code>password</code>	Developers building native desktop or mobile apps	The name <code>password</code> refers to the resource owner password grant type. The user provides their username and password to the client app, which may then use them to obtain an <code>access_token</code> .
<code>implicit</code>	Developers building a single page web app with no server back end	The user is taken to a page on UAA where they are asked to grant approvals to the client. After doing so, they are redirected to the <code>redirect_uri</code> with the access token in the URI fragment.
<code>client_credentials</code>	Developers when the client app needs to perform actions in UAA on its own behalf	Actions where a <code>client_credentials</code> grant type might be appropriate include creating or destroying user groups, managing user group membership, or creating or destroying other clients. The <code>client_credentials</code> grant can be likened to service accounts in legacy app ecosystems.
<code>refresh_token</code>	Developers must use the <code>refresh_token</code> grant type with either the <code>authorization_code</code> or <code>password</code> grant type. <code>refresh_token</code> cannot be used by itself.	Clients typically use the <code>refresh_token</code> to obtain a new access token without the need for the user to authenticate again. They do this by calling <code>/oauth/token</code> with <code>grant_type=refresh_token</code> . A refresh token is only issued to clients that have <code>refresh_token</code> in their list of <code>authorized_grant_types</code> .

## client.client\_id

A client is identified with a value up to 255 characters, called the `client_id`. Unlike the `user.id`, the `client_id` is often a human-readable identifier. For example, an app's name could be its `client_id`. This identifier is unique within the identity zone.

## client.secret

Client authentication occurs through a password mechanism called a `client_secret`.

UAA allows client credentials to be asserted in two different ways:

- With an HTTP authorization header using Basic authentication.
- By passing the `client_id` and `client_secret` as request parameters as part of an HTTP POST body using content type `application/x-www-form-urlencoded`.

For more information, see the [Client Password](#) section of the OAuth 2.0 Authorization Framework.

## client.redirect-uri

The `authorization_code` and implicit grant types rely on a user agent like a web browser is responsible for performing HTTP redirects to UAA and receiving a response from UAA. That response can be in the form of an access token or a code that is exchanged for an access token later.

A client that supports either of these two flows must have at least one URL in the client configuration. Alternatively, you can use multiple URLs and wildcards (\*) for ant path matching. For more information, see the [Class AntPathMatcher](#) section of the Spring Framework documentation.

URLs are registered using a comma-separated string.

## client.access-token-validity

UAA validates access tokens up to the time those tokens expire. Clients do the same, if they can validate tokens offline. The access token validity is the value in seconds from the time the token was created to when it expires.

## client.refresh-token-validity

UAA validates refresh tokens up to the time those tokens expire. Clients do the same, if they can validate tokens offline. The refresh token validity is the value in seconds from the time the token was created to when it expires.

# Choosing scopes and authorities

Client scopes are used to populate the scope claim when constructing an access token where the client acts on behalf of the user.

When an access token is created, UAA takes the user groups and intersects them with the client scopes. The intersection of these two fields are scopes that are eligible to be populated in the access token. There are two more validations that can further limit the scopes that get populated in the access token after the intersection has been decided:

- Did the user approve these scopes?
- Did the client request these scopes in the authorization request?

The token can never contain more scopes than the intersection between client scopes and user groups.

## client.autoapprove

Scopes in an access token must be approved by the granting entity.

During a `client_credentials` grant, the client itself is the granting entity and automatically assumes the client authorities are approved.

During a password grant, the user shares their password with the client app. The client app assumes this sharing to be implicit approval of the scopes that the client wants to be populated in the access token.

Two grant types, `authorization_code` and `implicit`, require specific user approval for the scopes to populate in the access token. UAA provides a UI that lets the user approve or deny scopes from being populated in the access token.

During client registration, the operator can configure the client to bypass this approval process by setting the auto-approve values to a single string with its value set to `true`. This results in any requested scope being approved automatically.

The value can also be a comma-separated list of selected scopes that do not require user approval.

## client.additional\_information

Clients can store custom attributes in a field called `additional_information`. This is a simple key value store. The following table describes these custom attributes:

Key	Value
<code>allowed_providers</code>	You can limit which users can use which apps. For example, in a Operations Manager deployment, you may have set up multiple IDPs. Or, you could be using Facebook and your organization's LDAP system.
	You can limit UAA to only issue an app tokens if the users are from a certain provider. To do this, configure the app's client with <code>allowed_providers="ldap"</code> . The value is a comma-separated string of <code>Identity Provider.origin</code> values.
<code>created_with</code>	UAA stores the scope <code>zones.write</code> in this field if the client was created using the <code>/identity-zones</code> endpoint. UAA uses this field to allow clients to be deleted by the same endpoint. This is not a configurable field.
<code>name</code>	Various tooling in the Operations Manager ecosystem creates clients with generated <code>Client.client_id</code> values. These tools often store a human-readable name in this field. For more information, see <a href="#">client.client_id</a> .
<code>approvals_deleted</code>	Contains a boolean value if performing an operation on the client resulted in all the client's user approvals were deleted. For example, changing the <code>client.client_secret</code> value causes UAA to delete all the approvals. UAA then stores a value of <code>true</code> in this field.
<code>token_salt</code>	Tokens, even stateless JWT, can be revoked. Revoked tokens do not pass a UAA token validation when the token is passed to the <code>/introspect</code> endpoint. UAA revokes a token if the client's secret has changed. There may be occasions to revoke all tokens for a certain client without having to change the client secret. You can do this by changing the <code>token_salt</code> . <code>token_salt</code> is an arbitrary string value that is used to generate a hash.

## Identity providers in UAA

You can configure identity providers (IDPs) with your Cloud Foundry User Account and Authentication (UAA) server.

## LDAP providers

The Lightweight Directory Access Protocol communicates with directory servers. Compared with the other external IDPs, LDAP is a very simple integration. It only requires configuration on UAA. Other types of

provider require that you make configuration changes on both UAA and on the external provider.

LDAP supports three different connection types:

- `ldap://`: Cleartext LDAP, typically over port 389
- `ldaps://`: An SSL/TLS connection, typically over port 636
- `ldap://` with StartTLS: A TLS handshake performed on a cleartext LDAP connection, typically over port 389

For more information, see [User Account and Authentication LDAP Integration](#) in the UAA repository on GitHub.

## SAML providers

The [SAML v2 standard](#) is a dominant player in the federated authentication space. It is one of the harder integrations to configure. When configuring SAML integration on UAA, you must configure both UAA and the SAML IDP. A mistake on either side causes assertions to be rejected and authentication to fail.

## OpenID Connect providers

The [OpenID Connect standard](#) is a simple identity layer on top of the OAuth 2.0 protocol. Clients can verify the identity of the end-user based on the authentication performed by the OIDC IDP, as well as to obtain basic profile information about the end-User in an interoperable and REST-like manner. When configuring OIDC integration on UAA, you must configure both UAA and the OIDC IDP. A mistake on either side causes tokens to be rejected and authentication to fail.

## Service provider versus identity provider

The SAML and OIDC specifications define two players in their protocol interaction:

- **Service provider (SP)**, the server that receives the assertion. This is typically UAA.
- **Identity provider (IDP)**, the server that receives the authentication request, authenticates the user and sends the assertion or token to the SP.

UAA can be configured to act as an SP or IDP. In most scenarios, UAA is the SP, and an external provider, such as Okta or Azure Directory or SAP Cloud Identity Services, is the IDP.

## View metadata

A SAML provider, either the SP or the IDP, presents a set of metadata. This metadata contains information about the server and is used to configure the opposing provider.

If you use UAA as an SP, you can download metadata through the `/saml/metadata` endpoint of your SAML provider. For example, `http://login.example.com/saml/metadata`. Metadata is in XML format. Using this information, you can configure the IDP.

If you use UAA as an IDP, fetch the metadata from the `/saml/idp/metadata` endpoint. For example, `http://login.example.com/saml/idp/metadata`.

## SAML IDP workflow

SAML provides two commonly used workflows: \* SP-initiated \* IDP-initiated.

The following sections describe each workflow.

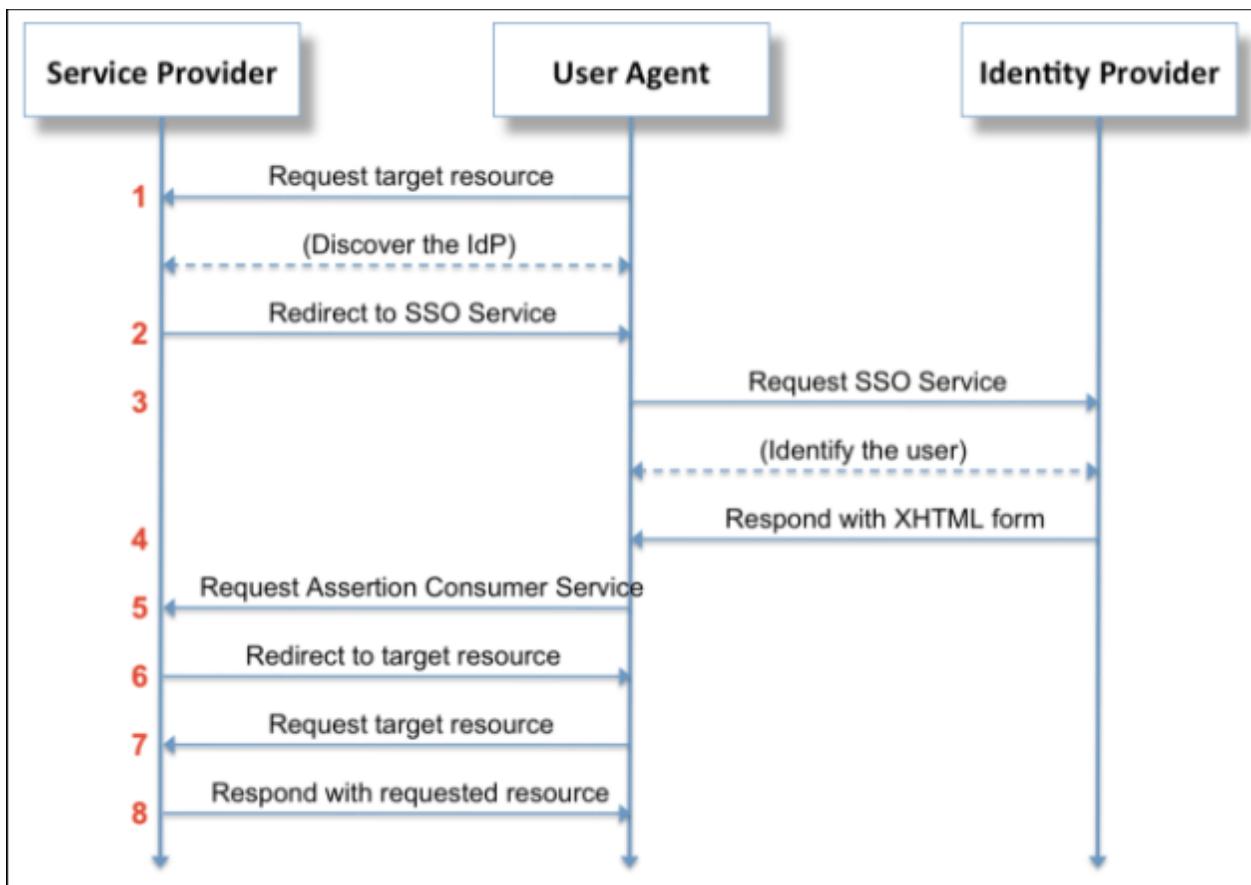
## SAML SP-initiated

If you go to the UAA login page and click a link to authenticate using your organization's SAML provider, you are using an SP-initiated flow.

The SP sends an authentication request to the IDP. See the following example:

```
xml version="1.0" encoding="UTF-8"?>
<saml2p:AuthnRequest
    xmlns:saml2p="urn:oasis:names:tc:SAML:2.0:protocol"
    AssertionConsumerServiceURL="https://host.../saml/SSO/alias/login.identity.cf-app.com"
    Destination="http://simplesamlphp.identity.cf-app.com/saml2/idp/SSOService.php"
    ForceAuthn="false"
    ID="a17j41337a9835i93h78hihc9a89j4b"
    IsPassive="false" IssueInstant="2017-05-03T21:16:15.989Z"
    ProtocolBinding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
    Version="2.0"
>
<saml2:Issuer xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion">
    Login.identity.cf-app.com
</saml2:Issuer>
<saml2p:NameIDPolicy Format="urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress" />
</saml2p:AuthnRequest>
```

After the IDP has authenticated the user, it sends an assertion back to the user. This step takes place in both SP-initiated and IDP-initiated flows. For information about the SAML response, see [IDP-Initiated](#).



## SAML IDP-initiated

You can start your authentication process with the IDP.

The IDP sends a SAML assertion to the SP, which in this case is UAA, similar to the following example:

```

<?xml version="1.0" encoding="UTF-8"?>
<samlp:Response
  xmlns:samlp="urn:oasis:names:tc:SAML:2.0:protocol"
  xmlns:saml="urn:oasis:names:tc:SAML:2.0:assertion"
  Destination="https://...url.../saml/SSO/alias/login.identity.cf-app.com"
  ID="_de497bc8a79e5f17202a30112181ea7c99325f8827"
  InResponseTo="a17j41337a9835i93h78hihc9a89j4b"
  IssueInstant="2017-05-03T21:51:01Z" Version="2.0">
  <saml:Issuer>
    http://simplesamlphp.identity.cf-app.com/saml2/idp/metadata.php
  </saml:Issuer>
  <ds:Signature xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
    <ds:SignedInfo>
      <ds:CanonicalizationMethod
        Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
      <ds:SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sh
      a1" />
      <ds:Reference URI="#_de497bc8a79e5f17202a30112181ea7c99325f8827">
        <ds:Transforms>
          <ds:Transform
            Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
        </ds:Transforms>
      </ds:Reference>
    </ds:SignedInfo>
    <ds:SignatureValue>...</ds:SignatureValue>
  </ds:Signature>
</samlp:Response>
  
```

```

/>
      <ds:Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
      <ds:Transforms>
        <ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
      <ds:DigestValue>QQZHHBC4KDxZ0H4FrTGF0nNR1E=</ds:DigestValue>
    </ds:Reference>
  </ds:SignedInfo>
  <ds:SignatureValue>...signature value...</ds:SignatureValue>
  <ds:KeyInfo>
    <ds:X509Data>
      <ds:X509Certificate>...x509 certificate value</ds:X509Certificate>
    </ds:X509Data>
  </ds:KeyInfo>
</ds:Signature>
<samlp>Status>
  <samlp:StatusCode Value="urn:oasis:names:tc:SAML:2.0:status:Success" />
</samlp>Status>
<saml:Assertion
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  ID="_ec6adc4fca9e3dc72fff4a1fd99561007777ac7afd"
  IssueInstant="2017-05-03T21:51:01Z"
  Version="2.0">
<saml:Issuer>http://simplesamlphp.identity.cf-app.com/saml2/idp/metadata.php</saml:Issuer>
  <ds:Signature xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
    <ds:SignedInfo>
      <ds:CanonicalizationMethod
        Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
      <ds:SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
      <ds:Reference URI="#_ec6adc4fca9e3dc72fff4a1fd99561007777ac7afd">
        <ds:Transforms>
          <ds:Transform
            Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
          <ds:Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
        </ds:Transforms>
      <ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
      <ds:DigestValue>dxt70Sy1/Xf6+BHgDU4Y0i4ogMg=</ds:DigestValue>
    </ds:Reference>
  </ds:SignedInfo>
  <ds:SignatureValue>...signature value...</ds:SignatureValue>
  <ds:KeyInfo>
    <ds:X509Data>
      <ds:X509Certificate>...x509 certificate value</ds:X509Certificate>
    </ds:X509Data>
  </ds:KeyInfo>
</saml:Assertion>

```

```

        </ds:KeyInfo>
    </ds:Signature>
    <saml:Subject>
        <saml:NameID
            Format="urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress"
            SPNameQualifier="login.identity.cf-app.com">
            marissa@test.org
        </saml:NameID>
        <saml:SubjectConfirmation
            Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
            <saml:SubjectConfirmationData
                InResponseTo="a9e378fialg38da5503ahgih430fah"
                NotOnOrAfter="2017-05-03T21:56:01Z"
                Recipient="https://url.../saml/SSO/alias/login.identity.cf-app.c
om" />
        </saml:SubjectConfirmation>
    </saml:Subject>
    <saml:Conditions
        NotBefore="2017-05-03T21:50:31Z"
        NotOnOrAfter="2017-05-03T21:56:01Z">
        <saml:AudienceRestriction>
            <saml:Audience>login.identity.cf-app.com</saml:Audience>
        </saml:AudienceRestriction>
    </saml:Conditions>
    <saml:AuthnStatement
        AuthnInstant="2017-05-03T21:16:21Z"
        SessionIndex="_a3ab48bcfb76ad78d4ac28231240af256be171c9f"
        SessionNotOnOrAfter="2017-05-04T05:51:01Z">
        <saml:AuthnContext>
            <saml:AuthnContextClassRef>
                urn:oasis:names:tc:SAML:2.0:ac:classes:Password
            </saml:AuthnContextClassRef>
        </saml:AuthnContext>
    </saml:AuthnStatement>
    <saml:AttributeStatement>
        <saml:Attribute
            Name="uid" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:
basic">
            <saml:AttributeValue xsi:type="xs:string">
                marissa@test.org
            </saml:AttributeValue>
        </saml:Attribute>
        <saml:Attribute Name="eduPersonAffiliation"
            NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
            <saml:AttributeValue xsi:type="xs:string">member</saml:Attribut
e>
            <saml:AttributeValue xsi:type="xs:string">marissa</saml:Attribut
ue>
        </saml:Attribute>
        <saml:Attribute Name="emailAddress"
            NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">

```

```

<saml:AttributeValue xsi:type="xs:string">
    marissa@test.org
</saml:AttributeValue>
</saml:Attribute>
</saml:AttributeStatement>
</saml:Assertion>
</samlp:Response>

```

## SAML configuration

UAA provides a limited set of attributes to configure when setting up an external IDP. You configure these attributes for each individual SAML IDP you set up in UAA.

A SAML IDP responds to requests from UAA with signed SAML assertions. These signatures are validated using a public key provided by the SAML provider. This public key can be provided as a raw RSA public key or encapsulated in an X.509 certificate. When dealing with the X.509 certificate, as per the [SAML V2.0 Metadata Interoperability Profile](#), UAA will not validate the certificate (including validating its expiry date), but will only get the public key from it.

### nameID

The `nameID` attribute is the element that provides the username in the SAML assertion. This is sometimes called the *subject* of the assertion. UAA links the external user to the internal shadow user record by matching the `nameID` to the `user.username`.

For example:

- `nameID: urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified`
- `nameID: urn:oasis:names:tc:SAML:2.0:nameid-format:persistent`
- `nameID: urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress`

The most common configuration is `unspecified`, where the IDP decides which attribute is the username.

The following example is what the `subject` element looks like in an assertion, with the username `EXAMPLE@test.org`:

```

<saml:Subject>
    <saml:NameID
        Format="urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress"
        SPNameQualifier="login.identity.cf-app.com">
        EXAMPLE@test.org
    </saml:NameID>
    <saml:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
        <saml:SubjectConfirmationData InResponseTo="a17j41337a9835i93h78hihc9a89j
4b"
            NotOnOrAfter="2017-05-03T21:21:21Z"
            Recipient="https://url.../saml/SSO/alias/login.identity.cf-app.com"
        />
    <saml:SubjectConfirmation>
<saml:Subject>

```

## AssertionConsumerService

The `AssertionConsumerService` attribute indicates which assertion consumer service URL the external IDP uses. This is used by the SP when it sends a SAML request for authentication to the IDP. The SP metadata contains one assertion consumer service by default, but can contain more.

The following examples are of assertion consumer services in SP metadata, organized by index:

```
<md:AssertionConsumerService
  Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
  Location="https://login.run.pivotal.io/saml/SSO/alias/login.run.pivotal.io"
  index="0"
  isDefault="true"/>
<md:AssertionConsumerService
  Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Artifact"
  Location="https://login.run.pivotal.io/saml/SSO/alias/login.run.pivotal.io"
  index="1"/>
<md:AssertionConsumerService
  Binding="urn:oasis:names:tc:SAML:2.0:bindings:URI"
  Location="https://login.run.pivotal.io/oauth/token/alias/login.run.pivotal.
io"
  index="2"/>
```

The following example is a SAML request to the IDP with the correct assertion consumer service selected:

```
<?xml version="1.0" encoding="UTF-8"?>
<saml2p:AuthnRequest
  AssertionConsumerServiceURL="https://....saml/SSO/alias/login.identity.c
f-app.com"
  Destination="http://simplesamlphp.identity.cf-app.com/saml2/idp/SSOServic
e.php"
  ForceAuthn="false"
  ID="a17j41337a9835i93h78hihc9a89j4b"
  IsPassive="false"
  IssueInstant="2017-05-03T21:16:15.989Z"
  ProtocolBinding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
  Version="2.0"
  xmlns:saml2p="urn:oasis:names:tc:SAML:2.0:protocol">
<saml2:Issuer
  xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion">
  Login.identity.cf-app.com
</saml2:Issuer>
<saml2p:NameIDPolicy
  Format="urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress"/>
</saml2p:AuthnRequest>
```

## idpMetadata

The `idpMetadata` attribute holds either an XML string or an URL.

This is an example of IDP metadata configuration in UAA:

```
idpMetadata: \http://simplesamlphp.identity.cf-app.com/saml2/idp/metadata.php
```

If the IDP is configured using a URL, UAA refreshes the metadata content from that URL every 10 minutes. This is useful for providers that rotate their keys frequently.

If the IDP is configured using metadata as an XML string, the metadata remains static. Rotating keys on the IDP requires you to reconfigure UAA with the new data.

This is an example of the XML metadata configuration:

```
<?xml version="1.0" encoding="UTF-8"?>
<md:EntityDescriptor
    xmlns:md="urn:oasis:names:tc:SAML:2.0:metadata"
    entityID="http://www.okta.com/k2lw4l5bP0DCMIIDBRYZ">
    <md:IDPSSODescriptor
        WantAuthnRequestsSigned="true"
        protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol">
        <md:KeyDescriptor use="signing">
            <ds:KeyInfo xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
                <ds:X509Data>
                    <ds:X509Certificate>..x509_certificates:X509Certificate</ds:X509Certificate>
                </ds:X509Data>
            </ds:KeyInfo>
        </md:KeyDescriptor>
        <md:NameIDFormat>urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress</md:NameIDFormat>
        <md:NameIDFormat>urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified</md:NameIDFormat>
        <md:SingleSignOnService
            Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
            Location="https://s.okta.com/app/env_1/k2lw4l5bP0DCMIIDBRYZ/sso/saml" />
        <md:SingleSignOnService
            Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect"
            Location="https://s.okta.com/app/env_1/k2lw4l5bP0DCMIIDBRYZ/sso/saml" />
    </md:IDPSSODescriptor>
</md:EntityDescriptor>
```

## showSamlLoginLink

The `showSamlLoginLink` shows the login link on the UAA home page. This appears when `showSamlLoginLink` is set to `true`. When you click this link, it starts the SP-initiated flow. This is frequently set to `false` when you use the IDP-initiated flow.

This is an example of a SAML login link text configuration:

```
showSamlLoginLink: true
```

## linkText

You can use the `linkText` attribute to specify the text on a link on the UAA home page. This appears when `showSamlLoginLink` is set to `true`.

This is an example of a link text configuration:

```
linkText: Log in with SSO
```

## metadataTrustCheck

The `metadataTrustCheck` attribute requires UAA to verify signatures of incoming messages. This requirement exists when `metadataTrustCheck` is set to `true`.

This is an example of a metadata trust check configuration:

```
metadataTrustCheck: true
```

## UAA performance metrics

Cloud Foundry User Accounts and Authentication (UAA) emits metrics constantly. These metrics help you to understand performance, troubleshoot problems, and assess the health of your installation in real time. These metrics are emitted through Loggregator.

This topic describes various metrics that UAA, virtual machines (VMs), and Java Virtual Machines (JVMs) emit.

## About UAA performance

The following tables explain different types of UAA and UAA-related metrics you can view. There are three different types of metrics discussed in these tables:

- **Global performance metrics:** Metric values that UAA emits
- **Virtual Machine vital statistics:** Metric values that UAA reads from the VM
- **Java Virtual Machine vital statistics:** Metric values that UAA reads from the JVM

Each table contains:

- **Name:** The name of the metric.
- **Type:** How the metric is displayed. For example, counters, gauges, or timers.
- **Description:** An explanation of what values this metric displays.
- **Example:** A code sample of this metric's output.
- **Indicator:** What changes in the metric's value may indicate over time.
- **Status:** Whether a metric is active or static. Active metrics may change between metrics emissions. Static metrics are fixed and do not change.

If consuming UAA metrics through the Firehose, incremental metrics, or metrics that capture an increment or decrement in a value because UAA's last emission, are expressed as cumulative values. For more information, see the [statsd-injector](#) repository on GitHub.

## Global performance metrics

The following table describes metrics that UAA emits:

Name	Type	Description	Example	Indicator	Status
<code>request.s.global.completed.counter</code>	Counter	Number of HTTP requests the server has processed since last metric emission. This metric includes all requests sent to the server, including health checks.	<code>uaa.requests.global.completed.count:1 c</code>	Use this metric to calculate request load and throughput.	Active
<code>request.s.global.completed.time</code>	Gauge	Average time in milliseconds spent per HTTP request. This metric is calculated as an average across all completed requests, including health checks.	<code>uaa.requests.global.completed.time:60 g</code>	A rise may indicate problems with server or database.	Active
<code>server.inflight.count</code>	Gauge	Number of requests the server is currently processing, also called in-flight requests.	<code>uaa.server.inflight.count:1 g</code>	If this number climbs continuously, it can indicate that servers are getting saturated and are unable to handle the incoming load.	Active
<code>request.s.global.unhealthy.v4.8_and_earlier;_lthy.counter</code>	Counter	Number of completed requests that exceeded the tolerable response time since last metric emission. Each URL group can have a different tolerable completion time, which is preconfigured in each UAA v4.9.0 and later release. These values are currently not configurable.	<code>uaa.requests.global.unhealthy.count:1 c</code>	If the number of requests not meeting tolerable completion time is growing, than either the tolerable request time must be configured to account for false negatives, or the server does not have enough capacity to handle the request load. The cause for this can be a need for an increase in server or database resources. In order to make a scaling decision, you need further metrics.	Active
<code>request.s.global.unhealthy.time</code>	Gauge	Average time in milliseconds per completed HTTP request that did not finish within the set tolerable time since startup.	<code>uaa.requests.global.unhealthy.time:250 g</code>	It can be useful to compare this metric to <code>uaa.requests.global.completed.time</code> .	Active
<code>request.s.global.status_4xx.count</code>	Counter	Number of HTTP requests that have returned <code>400</code> codes, or client errors, since UAA's last metrics emission. These do not indicate server errors. A <code>400</code> code may indicate an invalid request to the server.	<code>uaa.requests.global.status_4xx.count:1 c</code>	This metric gives the client the ability to calculate error rates. It is often used to detect faulty apps that may be causing unnecessary processing on the server.	Active
<code>request.s.global.status_5xx.count</code>	Counter	Number of HTTP requests that have returned <code>500</code> codes, or server errors, since UAA's last metrics emission.	<code>uaa.requests.global.status_5xx.count:1 c</code>	This metric gives the client the ability to calculate error rates and determine if further investigation is needed.	Active
<code>server.up.time</code>	Timer	Number of milliseconds that have elapsed since this server instance started.	<code>uaa.server.up.time:42346751 g</code>	This metric indicates the time since last startup.	Active

Name	Type	Description	Example	Indicator	Status
server.idle.time	Timer	Number of milliseconds that the server has spent in an idle state, when no requests were being processed. This allows a client to calculate the amount of actual, rather than cumulative, time the server has spent processing requests with <code>up.time-idle.time</code> .	uaa.server.idle.time:2346751 g	This metric allows the client to calculate when the server is receiving load time.	Active
databases.global.completed.count	Counter	Number of database queries the server has processed since UAA's last metrics emission.	uaa.database.global.completed.count:1 c	Use this metric to track the number of queries that have reached and been processed by the server over a period of time.	Active
databases.global.completed.time	Gauge	Average amount of time in milliseconds per database query.	uaa.database.global.completed.time:248 g	Use this metric to track the time to complete a database query on average.	Active
databases.global.unhealthy.count	Counter	Number of database queries that failed or did not meet the tolerated response time since UAA's last metrics emission. The response time is not configurable during runtime. By default, it is set to three seconds.	uaa.database.global.unhealthy.count:1 c	Use this metric to monitor database query success and failure over time.	Active
databases.global.unhealthy.time	Timer	Average amount of time in milliseconds per database query that was not within the tolerated response time.	uaa.database.global.unhealthy.time:4678623 g	Use this metric to monitor database response time.	Active

## About UAA vital statistics

These sections describe metrics that the UAA VM and JVM emit.

### Virtual Machine vital statistics

The following table describes metrics that the UAA VM emits:

Name	Type	Description	Example	Indicator	Status
vitals.vm.cpu.count	Gauge	How many CPUs are on this VM as reported by the JVM. This metric is useful when you want to read system load average. The number reported by load average must be correlated to the number of CPUs.	uaa.vitals.vm.cpu.count:4 g	This metric is required for a proper CPU load calculation.	Active

Name	Type	Description	Example	Indicator	Status
vitals.v m.cpu.lo ad	Gauge	Average system CPU load as reported by the JVM. The value is reported as a whole number multiplied by .01. For example, a value of 163 is read as 1.63.	uaa.vitals.vm .cpu.load:50 g	If the value of `(cpu.load / 100.0 / cpu count) is more than 2.0, this indicates that the system may be overloaded and processing data slowly.	Active
vitals.v m.memory .total	Gauge	Total OS memory, in bytes, as reported by the JVM.	uaa.vitals.vm .memory.total :1073741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.v m.memory .committ ed	Gauge	OS memory, in bytes, committed to UAA processes, as reported by the JVM.	uaa.vitals.vm .memory.commi tted:10737418 24 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.v m.memory .free	Gauge	Free OS memory, in bytes, as reported by the JVM.	uaa.vitals.vm .memory.free: 1073741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Active

## Java Virtual Machine vital statistics

The following table describes metrics that the UAA JVM emits:

Name	Type	Description	Example	Indicator	Status
vitals.j vm.cpu.lo ad	Gauge	UAA process CPU load average as reported by the JVM. This value is multiplied by 100 and reported as a whole number representing the CPU load on the VM incurred by the UAA process, excluding any other processes on the VM.	uaa.vitals.j vm.cpu.load: 25 g	Health and scaling. If CPU load is showing as high, this metric can be used to confirm that it is indeed the UAA using up the CPU and not other jobs on the same VM.	Active
vitals.j vm.threads .count	Gauge	Number of threads running inside the UAA process, as reported by the JVM.	uaa.vitals.j vm.thread.co unt:53 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.j vm.heap. init	Gauge	Minimum amount of OS memory, in bytes, requested by the UAA JVM process to be used as part of the Java heap memory, as reported by the JVM.	uaa.vitals.j vm.heap.init :1073741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Static
vitals.j vm.heap. committe d	Gauge	Guaranteed amount of Java heap memory, in bytes, committed to the UAA JVM process, as reported by the JVM.	uaa.vitals.j vm.heap.comm ited:107374 1824 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.j vm.heap. used	Gauge	Java heap memory, in bytes, currently in use by the UAA process as reported by the JVM.	uaa.vitals.j vm.heap.used :1073741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Static

Name	Type	Description	Example	Indicator	Status
vitals.j vm.heap. max	Gauge	Java heap memory, in bytes, that is the upper limit for the UAA processes, as reported by the JVM.	uaa.vitals.j vm.heap.max: 1073741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Static
vitals.j vm.non- heap.ini t	Gauge	Minimum non-Java memory, in bytes, acquired by the UAA process, as reported by the JVM.	uaa.vitals.j vm.non- heap.init:10 73741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.j vm.non- heap.com mitted	Gauge	Guaranteed non-Java memory, in bytes, committed by the UAA process, as reported by the JVM.	uaa.vitals.j vm.non- heap.committ ed:107374182 4 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.j vm.non- heap.use d	Gauge	Current non-Java memory, in bytes, that the UAA process can use, as reported by the JVM.	uaa.vitals.j vm.non- heap.used:10 73741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Active
vitals.j vm.non- heap.max	Gauge	Upper limit of non-Java memory, in bytes, that the UAA process can use, as reported by the JVM.	uaa.vitals.j vm.non- heap.max:107 3741824 g	Use this metric in conjunction with other performance metrics to assess system health.	Active

For more information about JVM memory, see the [Oracle documentation](#).

## Configuring authentication and enterprise SSO for TAS for VMs

In this section:

- [Configuring authentication and enterprise SSO for TAS for VMs](#)
- [Configuring CA as an identity provider](#)
- [Configuring PingFederate as an identity provider](#)

## Configuring authentication and enterprise SSO for TAS for VMs

By connecting TAS for VMs to SAML, LDAP, or OIDC external user store, you can use the User Account and Authentication (UAA) server to delegate authentication to existing enterprise user stores.

If your enterprise user store is exposed as a SAML, LDAP, or OIDC identity provider (IDP) for single sign-on (SSO), you can configure SSO to access Apps Manager and the Cloud Foundry Command Line Interface (cf CLI) without creating a new account, or if you use SAML or OIDC, without re-entering credentials.

For information about managing user identity and pre-provisioning user roles with SAML or LDAP, see [Adding existing SAML or LDAP users to an Operations Manager deployment](#).

For an explanation of the process used by the UAA server when it attempts to authenticate a user through LDAP, see [Configuring LDAP integration with VMware Tanzu Application Service \(TAS\) for VMs](#) in the

Broadcom Support Knowledge Base.



### Note

When integrating with an external IdP, such as LDAP, authentication within the UAA becomes chained. An authentication attempt with a user's credentials is first attempted against the UAA user store before the external provider, LDAP. For more information, see [Chained Authentication](#) in the *User Account and Authentication LDAP Integration* documentation on GitHub.

Use one of the following procedures to configure your deployment with SAML, LDAP, or OIDC.

## Configure TAS for VMs to use a SAML identity provider

In SAML terminology, the SAML protocol communicates user data between an IdP (identity provider) and a service provider (SP).

To connect TAS for VMs with SAML, follow both of these procedures:

- [Configure TAS for VMs as a Service Provider for SAML](#)
- [Configure SAML as an Identity Provider for TAS for VMs](#)

### Configure TAS for VMs as a service provider for SAML

To configure TAS for VMs to use a SAML IdP (identity provider):

1. Go to the VMware Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Click **Domains**.
4. Record your system domain.

#### Domains

For help configuring these fields, see the [Configure Domains](#) section of the *Configuring PAS* topic in the PCF documentation.

**System domain \***

system.example.com

**Apps domain \***

apps.example.com

**Save**

5. Click **Authentication and Enterprise SSO** and select **SAML Identity Provider**.

 SAML Identity Provider

Provider Name \*

Name of Identity Provider. Allowed characters are alphanumeric, plus `\_` , and `-` . !

Display Name \*

Provider Metadata (if you would rather provide an SSO endpoint URL, skip to the next field)

(OR) Provider Metadata URL

Name ID Format\*

Email Address

Email Domain(s)

First Name Attribute

Last Name Attribute

Email Attribute

External Groups Attribute

Sign Authentication Requests

Require Signed Assertions

You must manually deactivate a SAML IDP that was created by TAS for VMs when you no longer require it.

1. Set the **Provider name**. This is a unique name you create for the identity provider. This name can include only alphanumeric characters, `+`, `_`, and `-`. You must not change this name after deployment because all external users use this name to link to the provider.

2. Enter a **Display name**. Your identity provider display name appears as a link on your Operations Manager login page. You can access this link at <https://login.SYSTEM-DOMAIN>, where **SYSTEM-DOMAIN** is the system domain you recorded from the **Domains** pane.
3. Retrieve the metadata from your IdP and copy it into the **Provider metadata** or the **Provider metadata URL** text boxes, depending on whether your IdP exposes a metadata URL or not. For more information, see [Configure SAML as an Identity Provider for TAS for VMs](#). VMware recommends that you use the provider metadata URL rather than provider metadata because the metadata can change. Do one of the following:
  - If your IdP exposes a metadata URL, provide the metadata URL.
  - Download your IdP metadata and paste this XML into the **Provider metadata** text box.

You must select one of the previous configurations. If you configure both, your IdP by default goes to the **Provider metadata URL**.

For information about onboarding SAML users and mapping them to TAS for VMs user roles, see [Adding existing SAML or LDAP users to an Operations Manager deployment](#).
4. Select the **Name ID format** for your SAML IdP (identity provider). This translates to `username` in TAS for VMs. The default is **Email Address**.
5. For **\*\*\*\***, enter a comma-separated list of the email domains for external users who are to receive invitations to Apps Manager.
6. For **First name attribute** and **Last name attribute**, enter the attribute names in your SAML database that correspond to the first and last names in each user record. For example, `first_name` and `last_name`. This text box is case-sensitive.
7. For **Email attribute**, enter the attribute name in your SAML assertion that corresponds to the email address in each user record. For example, `EmailID`. This text box is case-sensitive.
8. For **External groups attribute**, enter the attribute name in your SAML database that defines the groups that a user belongs to. For example, `group_memberships`. To map the groups from the SAML assertion to admin roles in TAS for VMs, see [Grant Admin Permissions to an External Group \(SAML or LDAP\)](#) in *Creating and Managing Users with the UAA CLI (UAAC)*. This text box is case-sensitive.
9. By default, all SAML authentication requests from TAS for VMs are signed. To change this, deselect the **Sign authentication requests** check box and configure your IdP (identity provider) to verify SAML authentication requests.
10. To validate the signature for the incoming SAML assertions, activate the **Required signed assertions** check box and configure your IdP (identity provider) to send signed SAML assertions.
11. Click **Save** and return to the Tanzu Operations Manager Installation Dashboard.
12. Click **Review Pending Changes**.
13. Click **Apply Changes**.

## Configure SAML as an identity provider for TAS for VMs

To configure a SAML identity provider to designate TAS for VMs as an SP:

1. Download the SP metadata from <https://login.SYSTEM-DOMAIN/saml/metadata>, where **SYSTEM-DOMAIN** is the system domain you recorded from the **Domains** pane.

For configuration instructions, see the documentation from your identity provider.

2. See the following table for information about certain industry standard identity providers and how to integrate them with TAS for VMs:

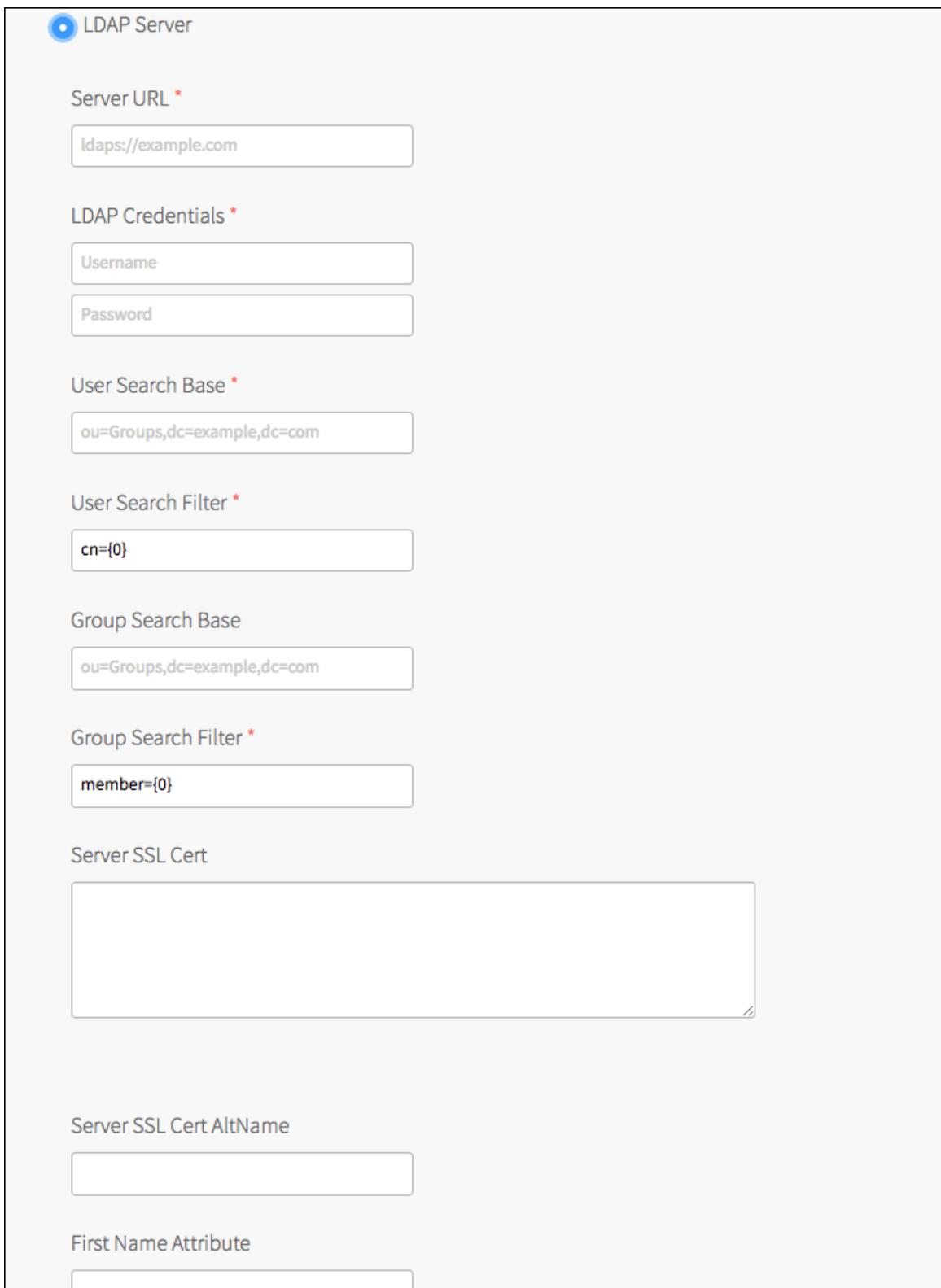
Solution Name	Integration Guide
CA Single Sign-On aka CA SiteMinder	<a href="#">Configuring CA as an Identity Provider</a>
Ping Federate	<a href="#">Configuring PingFederate as an Identity Provider</a>
Active Directory Federation Services (AD FS)	<a href="#">Configuring AD FS as an Identity Provider</a>

Some identity providers permit uploads of SP metadata while other providers require you to manually enter the SP metadata into a form. If your identity provider requires manual entry but is not listed in the previous table, see [Configuring CA as an identity provider](#).

## Configure LDAP as an identity provider for TAS for VMs

To integrate the UAA with an LDAP server:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Click **Authentication and Enterprise SSO**.



The screenshot shows the configuration interface for an LDAP server. The fields filled in are:

- Server URL \***: ldaps://example.com
- LDAP Credentials \***: (empty fields for Username and Password)
- User Search Base \***: ou=Groups,dc=example,dc=com
- User Search Filter \***: cn={0}
- Group Search Base**: ou=Groups,dc=example,dc=com
- Group Search Filter \***: member={0}
- Server SSL Cert**: (empty text area)
- Server SSL Cert AltName**: (empty text area)
- First Name Attribute**: (empty text area)

4. In **User authentication mechanism**, click **LDAP server**.
5. For **Server URLs**, enter the URL that points to your LDAP server. You can configure multiple LDAP server URLs for failover purposes, so that if UAA fails to connect to the first URL, it retries with the second URL, and so on. All URLs must be in the same domain. To configure multiple LDAP server URLs, enter a space-separated list. Each URL must include one of the following protocols:
  - `ldap://`: This specifies that the LDAP server uses an unencrypted connection.

- `ldaps://`: This specifies that the LDAP server uses SSL for an encrypted connection and requires that the LDAP server holds a trusted certificate or that you import a trusted certificate to the JVM trust store.



### Important

Only a single LDAP forest can be supported for the entire TAS for VMs installation. If you need support for multiple domains and forests, then SAML integration is the recommended solution.

- For **LDAP credentials**, enter the LDAP distinguished name (DN) and password for binding to the LDAP server. For example, `cn=administrator,ou=Users,dc=example,dc=com`.

VMware recommends that you provide LDAP credentials that grant read only permissions on the LDAP search base and the LDAP group search base. Additionally, if the bind user belongs to a different search base, you must use the full DN.



### Caution

VMware and Cloud Foundry discourage the reusing of LDAP service accounts across environments. LDAP service accounts cannot be subject to manual lockouts, such as lockouts that result from users using the same account. Also, LDAP service accounts cannot be subject to automated deletions, because disruption to these service accounts might prevent user logins.

- For **User search base**, enter the location in the LDAP directory tree from which any LDAP user search begins. The typical LDAP search base matches your domain name. For example, a domain named “cloud.example.com” typically uses the following LDAP user search base: `ou=Users,dc=example,dc=com`
- For **User search filter**, enter a string that defines LDAP user search criteria. This search criteria allows LDAP to use more effective and efficient searches. For example, the standard LDAP search filter `cn=Smith` returns all objects with a common name equal to `Smith`. In the LDAP search filter string that you use to configure TAS for VMs, use `{0}` instead of the user name. For example, use `cn={0}` to return all LDAP objects with the same common name as the user name. In addition to `cn`, other attributes commonly searched for and returned are `mail`, `uid` and, in the case of Active Directory, `sAMAccountName`. For instructions for testing and troubleshooting your LDAP search filters, see [Configuring LDAP integration with VMware Tanzu Application Service \(TAS\) for VMs](#) in the Broadcom Support Knowledge Base.
- For **Group search base**, enter the location in the LDAP directory tree from which the LDAP group search begins. For example, a domain named “cloud.example.com” typically uses the following LDAP group search base: `ou=Groups,dc=example,dc=com` This is required if you are mapping LDAP groups to an admin role. To map the groups under this

search base to admin roles in TAS for VMs, see [Grant Admin Permissions to an External Group \(SAML or LDAP\)](#) in *Creating and managing users with the UAA CLI (UAAC)*.

To onboard individual LDAP users and map them to TAS for VMs roles, see [Adding existing SAML or LDAP users to a Operations Manager deployment](#).

10. For **Group search filter**, enter a string that defines LDAP group search criteria. The standard value is `member={0}`. This string is required if you are mapping LDAP groups to an admin role.
11. For **Maximum group search depth**, enter a value between `1` and `10` that sets the maximum LDAP group search depth. The default value is `1`, which turns off nested group search.
12. For **Server SSL certificate**, copy and paste, in the root certificate, from your CA certificate or your self-signed certificate. This is required only for `ldaps://` URLs.
13. For **First name attribute** and **Last name attribute**, enter the attribute names in your LDAP directory that correspond to the first and last names in each user record. For example, `cn` and `sn`.
14. For **Email attribute**, enter the attribute name in your LDAP directory that corresponds to the email address in each user record. For example, `mail`.
15. For **Email domains**, enter a comma-separated list of the email domains for external users who are to receive invitations to Apps Manager.
16. For **LDAP referrals**, select how UAA handles LDAP server referrals out to other external user stores. UAA can:
  - **Automatically follow any referrals.**
  - **Ignore referrals and return partial result.**
  - **Throw exception for each referral and abort.**
17. Click **Save** and return to the Tanzu Operations Manager Installation Dashboard.
18. Click **Review Pending Changes**.
19. Click **Apply Changes**.

## Configure TAS for VMs to use an OIDC identity provider

To integrate the UAA with an external OIDC identity provider (IDP):

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Click **Authentication and Enterprise SSO**.
4. Click **OIDC identity provider**.
5. Set the **Provider name**. This is a unique name you create for the identity provider. This name can include only alphanumeric characters, `+`, `_`, and `-`. Do not change this name after deployment because all external users use this name to link to the provider.
6. Enter a **Display name**. Your identity provider display name appears as a link on your Operations Manager login page.

7. For **Provider metadata URL**, enter the OpenID server endpoint URL that returns the configuration metadata for your OIDC identity provider. This URL usually has this format: `https://<example-oidc-provider>.com/.well-known/openid-configuration`. It serves as a JSON that contains the OIDC provider specifications. For example, its `issuer`, `authorization_endpoint`, and `token_endpoint` values.
8. For **Client ID**, enter the ID of the client registered with the external OIDC provider for use by the UAA. This external OIDC client must be configured according to the following general requirements. If applicable, different OIDC providers might use slightly different naming for these configuration options:
  - **Client**: Per security best practices, register a dedicated client for use by TAS for VMs. Some providers might refer to a “client” as an “application”. Save the client secret for the next step.
  - **Grant type**: Make sure that the client can do the `Authorization Code` OAuth flow.
  - **Sign-in redirect URIs**: Include a URL in this format: `https://login.<SYSTEM-DOMAIN>/login/callback/<PROVIDER-NAME>` where:
    - `SYSTEM-DOMAIN` is the domain for system level components. You can find this value under the **Domains** section of the TAS for VMs tile.
    - `PROVIDER-NAME` is the unique name you create for the identity provider in the UAA. This can match the **Provider name** value that you previously entered.
  - **Users**: Make sure that the users to whom you want to grant access to TAS for VMs are allowed access to this client or application.
  - **Groups**: Verify that this client can obtain all relevant OIDC user groups information that you need to use mappings from external OIDC user groups to internal TAS for VMs scopes. For example, if you want to grant TAS for VMs admin scopes to all external OIDC users belonging to the `example-inc-operators` group, make sure that this client can access this group memberships.

For more information about how to perform external group mappings, see [Grant Admin Permissions to an External Group \(SAML, LDAP, or OIDC\)](#).

9. For **Client secret**, enter the client secret of the client whose ID was entered earlier in the procedure.
10. For **Scopes**, enter a comma-separated list of scopes to request from the external OIDC provider. In accordance with OIDC 1.0 specifications, requesting certain scopes from an OIDC provider can cause additional claims. For example, requesting `openid`, `profile`, `email` scopes (the current default value for this input field) can allow the UAA to obtain claims containing the user’s first name, last name, and email. Additionally, please include the scope or scopes, for example, `groups`) that allows the UAA to obtain the user’s group memberships. Consult your OIDC provider’s documentation to decide the exact scopes to request to obtain sufficient claims.
11. For **Email domains**, enter a comma-separated list of the email domains for external users to invite to Apps Manager.
12. For **Username claim**, enter the attribute in your OIDC provider claim that corresponds to the TAS for VMs user name.

13. For **First name claim**, enter the attribute in your OIDC provider claim that corresponds to the user's first name in TAS for VMs.
14. For **Last name claim**, enter the attribute in your OIDC provider claim that corresponds to the user's last name in TAS for VMs.
15. For **Email claim**, enter the attribute in your OIDC provider claim that corresponds to the user's email in TAS for VMs.
16. For **External groups claims**, enter the attribute in your OIDC provider claim that defines the groups to which a user belongs. This is a comma separated list, and is used to map to internal TAS for VMs scopes.
17. **Enable caching for the JSON Web Key Set (JWKS)** is enabled by default. This caching feature improves performance by using the locally cached keys to validate tokens from the external OIDC identity provider. Disabling caching is recommended in rare situations where the keys are rotated very frequently (for example, every hour).
18. Click **Save** and return to the Tanzu Operations Manager Installation Dashboard.
19. Click **Review Pending Changes**.
20. Click **Apply Changes**.

## Configuring CA as an Identity Provider

You can configure single sign-on (SSO) between Operations Manager and CA Identity and Access Management.

Creating a partnership between CA and Operations Manager involves the following steps:

1. Installing and configuring the prerequisites. For more information, see [Prerequisites](#).
2. Configuring CA SSO as an identity provider (IDP). For more information, see [Configure CA as the SAML identity provider for Operations Manager](#).
3. Configuring the service provider (SP). For more information, see [Configure Operations Manager as the SAML service provider for CA single sign-on](#).

## Prerequisites

To configure SSO between CA and Operations Manager, you must have:

- An installation of CA SSO v12.52 or later.
- Configured user store and session store.
- A signed certificate by a certificate authority (CA).
- A protected IDP URL with CA SSO by creating:
  - Authentication scheme
  - Domain
  - Realm
  - Rules and policy

- An Operations Manager environment at <https://console.SYSTEM-DOMAIN>, where `SYSTEM-DOMAIN` is the system domain of your Operations Manager installation.

## Configuring CA as the SAML identity provider for Operations Manager

To configure CA SSO as the SAML IDP for Operations Manager:

1. Download the SP metadata.
  1. Go to <https://login.SYSTEM-DOMAIN/saml/metadata>, where `SYSTEM-DOMAIN` is the system domain of your Operations Manager installation.
  2. Log in to CA SSO.
  3. Go to **Federation**.
  4. Select **Partnership Federation**
  5. In the **Actions** menu, select **Export Metadata**.
  6. Save the exported metadata in an XML file.
2. Follow the procedure in [Configure TAS for VMs as a Service Provider for SAML](#) in *Configuring Authentication and Enterprise SSO for TAS for VMs* to set the IDP metadata on Operations Manager.
3. Paste the contents of the XML file into the **Provider metadata** field.
4. Click **Save**.
5. Return to the Tanzu Operations Manager Installation Dashboard.
6. Click **Review Pending Changes**.
7. Click **Apply Changes**.

## Configuring Operations Manager as the SAML service provider for CA Single sign-on

This section explains how to configure Operations Manager as the SAML SP for CA SSO.

### Configure identity provider and service provider entities

To configure IDP and SP entities in CA SSO:

1. Go to <https://login.SYSTEM-DOMAIN/>, where `SYSTEM-DOMAIN` is the system domain of your Operations Manager installation.
2. Log in to CA SSO.
3. Go to **Federation**.
4. Click **Partnership Federation**.
5. Click **Entity**.
6. Click **Create Entity**.

7. To create a local entity, configure the fields with the following values:
  - **Entity Location:** Local
  - **Entity Type:** SAML2 IDP
  - **Entity ID:** Enter an ID for your local identity provider. For example, `https://ca-technologies.xxx.com`.
  - **Entity Name:** Create a name for your local identity provider.
  - **Base URL:** Enter the fully-qualified domain name for the host service CA SSO Federation Web Services.
  - **Signing Private Key Alias:** Select the private key alias or import a private key.
  - **Signed Authentication Requests Required:** Select **No**.
  - **Supported NameID format:** Enter `urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress` and `urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified` to select both email address and unspecified as supported NameID formats.
8. To create a remote entity:
  1. Click **Import Metadata**.
  2. Download the SP metadata from `https://login.SYSTEM-DOMAIN/saml/metadata`, where `SYSTEM-DOMAIN` is the system domain of your Operations Manager installation.
  3. Save the SP metadata to an XML file.
  4. Browse and select the saved XML metadata you downloaded in the previous step.
  5. Provide a name for the **Remote Service Provider Entity**.
  6. Provide an alias for the **Signing Certificate** imported from the metadata.  
Operations Manager signs the outgoing SAML authentication requests.
  7. Click **Save**.

## Configure partnership between CA SSO and Operations Manager

To configure a partnership between CA SSO and Operations Manager:

1. Go to `https://login.SYSTEM-DOMAIN/`, where `SYSTEM-DOMAIN` is the system domain of your Operations Manager installation.
2. Log in to CA SSO.
3. Go to **Federation**.
4. Click **Partnership Federation**.
5. Click **Create Partnership**.
6. To configure the partnership, configure the fields with the following values:
  - **Add Partnership Name:** Enter a name for your partnership.
  - **(Optional) Description:** Enter a relevant description for your partnership.

- **Local IPD ID:** Enter the Local Service Provider ID you created in [Configure Identity Provider and Service Provider Entities](#).
- **Remote SP ID:** Enter the Remote SP ID you created in [Configure Identity Provider and Service Provider Entities](#).
- **Base URL:** This field will be pre-populated.
- **Skew Time:** Enter any skew time required by your environment.
- **User Directories and Search Order:** Select the required directories in the required search order.

7. Click **Next**.
8. On the Federation Users page, accept the default values.
9. Click **Next**.
10. To complete the **Name ID Format** section:
  1. Select **Email Address** from the **Name ID Format** dropdown.
  2. Select **User Attribute** from the **Name ID Type** dropdown.

Operations Manager does not support processing SAML Assertion Attributes at this time. You can skip filling out the **Assertion Attributes** fields.
11. Click **Next**.
12. To complete the **SSO and SLO** section:
  1. Enter the **Authentication URL** that is protected by CA SSO under prerequisites.
  2. For **SSO Binding**, click **HTTP-POST**.
  3. In the **Audience** field, enter `http://login.SYSTEM-DOMAIN`, where `SYSTEM-DOMAIN` is the system domain of your Operations Manager installation.  
The **Audience** field requires `http://` instead of `https://`. This is only a naming convention within the schema and does not determine connection security.
  4. Select **Both IDP and SP Initiated** from the **Transactions Allowed** dropdown.
  5. The **Assertion Consumer Service URL** field is be pre-populated using information from the SP entity.
13. Click **Next**.
14. To complete the **Configure Signature and Encryption** section:
  1. In the **Signing Private Key Alias** dropdown, verify that the correct **Private Key Alias** is selected.
  2. Verify that the correct **Verification Certificate Alias** is selected in the **Verification Certificate Analysis** drop-down menu. This alias is the same certificate that you created when you imported the remote SP entity ID in [Remote Service Provider Entity ID](#).
  3. Select **Sign Both** from the **Post Signature Options** drop-down menu.



### Important

 Operations Manager does not support encryption options at this time.

4. Click **Finish**.
15. To activate the partnership, expand the **Action** drop-down menu for your partnership and click **Activate**.

## Configuring PingFederate as an identity provider

You can configure single sign-on (SSO) between PingFederate and VMware Tanzu Application Service for VMs (TAS for VMs).

You can create an SSO partnership between PingFederate and TAS for VMs using the following steps:

1. Configuring PingFederate as an identity provider (IDP). For more information, see [Configure PingFederate as the SAML Identity Provider for TAS for VMs](#).
2. Configuring the service provider (SP). For more information, see [Configure TAS for VMs as the SAML Service Provider for PingFederate](#).

## Configure PingFederate as the SAML identity provider for TAS for VMs

To configure PingFederate as the SAML IDP for your TAS for VMs tile:

1. Download your IDP metadata from PingFederate Server:
  1. Log in to PingFederate Administrative Console.
  2. Select **Administrative Functions**.
  3. Click **Metadata Export**.
  4. If your PingFederate server is configured to act as both an IDP and an SP, indicate which type of configuration you want to export. The Signing key can be exported. You can skip the options related to encryption keys and metadata attribute contract because they are not supported at this time.
  5. Click **Next**.
2. Follow the procedure in [Configure TAS for VMs as a Service Provider for SAML](#) in *Configuring Authentication and Enterprise SSO for TAS for VMs* to set the IDP metadata on TAS for VMs.

## Configure TAS for VMs as the SAML service provider for PingFederate

To configure TAS for VMs as the SAML SP for PingFederate:

1. Download the SP metadata from <https://login.SYSTEM-DOMAIN/saml/metadata>, where **SYSTEM-DOMAIN** is the system domain of your Operations Manager installation.
2. Save the SP metadata to an XML file.
3. Import the SP metadata to PingFederate:
  1. Log in to PingFederate Administrative Console.

2. Under **Main Menu**, select **IdP Configuration**.
  3. Select **SP Connection**.
  4. Click **Import**.
  5. In the **Import Connection** pane, browse and select the `.xml` file downloaded in the previous step.
  6. Click **Import**.
  7. Click **Done**.
4. TAS for VMs expects the NameID format to be an email address, such as `urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress`, and the value to be the email address of the currently logged-in user. The SSO does not function without this setting.
    1. Under **Main Menu**, click the connection name. To see a full list of connections, click **Manage All SP**.
    2. Under the **SP Connection**, select **Browser SSO**.
    3. Click **Configure Browser SSO**.
    4. Under **Browser SSO**, select **Assertion Creation**.
    5. Select **Configure Assertion Creation**.
    6. On the **Summary** pane, select **Identity Mapping**.
    7. Select **Standard**.
    8. For the NameID format, select **Email Address** and enter the email address of the user.
  5. Select the Authentication Source:
    1. Under the **SP Connection**, select **Browser SSO**.
    2. Select **Configure Browser SSO**.
    3. In **Browser SSO**, select **Assertion Creation**.
    4. Select **Configure Assertion Creation**.
    5. On the **Summary** pane, select **IdP Adapter Mapping**.
    6. Select **Adapter Instance Name**.
    7. On the **Summary** pane, select **Adapter Instance**.
  6. Activate the SSO Browser Profiles:
    1. Under **SP Connection**, select **Browser SSO**.
    2. Select **Configure Browser SSO**.
    3. On the **Summary** pane, select **SAML Profiles**.
    4. Ensure that the **IdP-Initiated SSO** and **SP-Initiated SSO** check boxes are activated.



### Important

TAS for VMs does not support SLO profiles at this time. You can leave them deactivated.

7. Activate the SP Connection.

## Traffic and security

In this section:

- **Front end**
  - Securing incoming traffic
  - Configuring SSH access for TAS for VMs
  - App SSH components and processes
  - Configuring front end idle timeout for Gorouter and HAProxy
- **Load balancing and routing**
  - Using your own load balancer
  - Enabling and configuring TCP routing
  - Enabling IPv6 for hosted apps
  - Supporting HTTP/2
  - Configuring proxy settings for all apps
  - Switching app domains
  - TLS connections in TAS for VMs
  - Configuring load balancer health checks for TAS for VMs routers
  - Configuring route service lookup
- **Internal app security**
  - Container security
  - Container-to-container networking
  - App security groups
  - Restricting app access to internal TAS for VMs components
- **Certificates and credentials**
  - Rotating runtime CredHub encryption keys
  - Rotating the Cloud Controller database encryption key
  - Securing service instance credentials with runtime CredHub
  - Providing a certificate for your TLS termination point
  - Trusted system certificates
  - CredHub
    - CredHub credential types
    - Backing up and restoring CredHub instances

- Using hardware security modules with CredHub
  - Using a key management service with CredHub
  - Setting up and deploying CredHub with BOSH
  - Troubleshooting CredHub
- **Component communications**
    - BOSH DNS network communications
    - Cloud Controller network communications
    - Container-to-container network communications
    - CredHub network communications
    - Diego network communications
    - Loggregator network communications
    - MySQL network communications
    - NATS network communications
    - Routing network communications
    - UAA network communications

## Front end

In this section:

- Securing incoming traffic
- Configuring SSH access for TAS for VMs
- App SSH components and processes
- Configuring front end idle timeout for Gorouter and HAProxy

## Securing incoming traffic in TAS for VMs

You can secure HTTP traffic into your TAS for VMs deployment with TLS certificates. You can also configure the location where your deployment stops TLS depending on your needs and certificate restrictions.

## Protocol support

The Gorouter supports HTTP/HTTPS requests only.

For more information about features supported by the Gorouter, see [HTTP Routing](#).

To secure non-HTTP traffic over TCP routing, terminate TLS at your load balancer or at the app. For more information, see [Enabling TCP Routing](#).

## TLS termination options for HTTP routing

There are several options for terminating TLS for HTTP traffic. You can stop TLS at the Gorouter, your load balancer, or both.

The following table summarizes TLS termination options and which option to choose for your deployment:

If the following applies to you:	Then configure TLS termination at:	Related topic and configuration procedure
<ul style="list-style-type: none"> <li>You want the optimum balance of performance and security, and</li> <li>You want to make minimum changes to your load balancer, or</li> <li>You are deploying TAS for VMs to AWS. For information about AWS limitations, see <a href="#">TLS Cipher Suite Support by AWS ELBs</a>.</li> </ul>	<b>Gorouter only</b>	<a href="#">Terminating TLS at the Gorouter Only</a>
<ul style="list-style-type: none"> <li>You require TLS termination at a load balancer, or</li> <li>You want the highest level of security, and</li> <li>You do not mind a slightly less performant deployment.</li> </ul>	<b>Load Balancer and Gorouter</b>	<a href="#">Terminating TLS at the Load Balancer and Gorouter</a>
<ul style="list-style-type: none"> <li>You require TLS termination at a load balancer, and</li> <li>You prefer unencrypted traffic between the Load Balancer and the Gorouter.</li> </ul>	<b>Load Balancer only</b>	<a href="#">Terminating TLS at the Load Balancer Only</a>

## Certificate requirements

The following requirements apply to the certificates you use to secure traffic into TAS for VMs:

- You must obtain at least one TLS certificate for your environment.
  - In a production environment, use a signed TLS certificate (trusted) from a known certificate authority (CA).
  - In a development or testing environment, you can use a trusted CA certificate or a self-signed certificate. You can generate a self-signed certificate with `openssl` or a similar tool.



Alternatively, you can use the TAS for VMs Tanzu Operations Manager interface to generate a certificate. Certificates generated in TAS for VMs are signed by the Tanzu Operations Manager Certificate Authority. They are not technically self-signed, but they are sometimes referred to as "self-signed certificates" in the Tanzu Operations Manager UI and throughout this documentation. For more information, see the [Multiple certificates](#)

In order to support custom domains on TAS for VMs, an operator has to configure the Gorouter with a certificate that represents the domain. VMware recommends that operators add a new certificate instead of reissuing a single certificate when adding TLS support for an additional domain. Using multiple certificates provides a security benefit in that it prevents clients from discovering all the custom domains of apps running on a TAS for VMs platform.

The Gorouter supports SNI and can be configured with multiple certificates, each which can optionally have wildcard and alternative names. The Gorouter uses SNI to determine the correct certificate to present in a TLS handshake. It requires clients to support the SNI protocol by sending a server name outside the encrypted request payload. For clients that do not support SNI, the Gorouter presents a default certificate. The default is the first certificate keypair in the Gorouter's configuration.

The Gorouter decides which certificate to provide in the TLS handshake as follows:

- If a client provides an SNI header with a ServerName that matches to a configured certificate keypair, the Gorouter returns the matching certificate.
- If a client provides an SNI header with a ServerName that does not match a configured certificate keypair, the Gorouter returns the default certificate.

The first certificate keypair listed is used as the default.

The Gorouter supports both RSA and ECDSA certificates in PEM encoding. In the case that a certificate chain is required, the order should be as follows: primary certificate, intermediate certificate, then root certificate.

## How to configure multiple certificate keypairs

To configure multiple HTTPS certificate keypairs for TAS for VMs, add each keypair along with a meaningful name in the applicable **Certificates and private keys for the Gorouter and HAProxy** fields of the **Networking** pane in TAS for VMs. For more information, see [Configure Networking](#) in [Configuring TAS for VMs](#).

## TLS cipher suite support

Some TAS for VMs components like the Gorouter support additional TLS cipher suites to accommodate older clients. As a security best practice, only configure the TLS cipher suites that you need for your deployment.

### Default Gorouter cipher suites

By default, the Gorouter supports the following TLS cipher suites:

TLS Version	RFC	OpenSSL
1.2	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	ECDHE-RSA-AES128-GCM-SHA256
1.2	TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	ECDHE-RSA-AES256-GCM-SHA384
1.3	TLS_AES_128_GCM_SHA256	TLS_AES_128_GCM_SHA256
1.3	TLS_AES_256_GCM_SHA384	TLS_AES_256_GCM_SHA384
1.3	TLS_CHACHA20_POLY1305_SHA256	-

You can override the default cipher suites in the **Networking** pane of the TAS for VMs tile. For more information about using custom SSL ciphers, see [Gorouter Only](#) or [Load balancer and Gorouter](#).

## TLS cipher suite support by AWS load balancers

AWS Classic Load Balancers (formerly referred to as ELBs) support configuration of cipher suites for front end connections with clients only. When configuring Classic Load Balancers to forward requests to Gorouters over TLS, you might encounter a [Cipher Suite Mismatch](#) error. This is because the cipher suites supported by Classic Load Balancers for TLS handshakes with back ends (Gorouters in this case) are hardcoded, undocumented, and do not support the Gorouter default cipher suites.

You can configure TLS termination in one of the following ways:

- Configure Classic Load Balancer listeners in TCP mode. This allows TCP connections from clients to pass through the Classic Load Balancer to Gorouters on port 443. With this configuration, Gorouters are the first point of TLS termination.
- If you require TLS termination at an AWS load balancer in addition to terminating at the Gorouter, use [AWS Application Load Balancers \(ALBs\)](#) that support the Gorouter default cipher suites.

## TLS v1.3

You cannot configure cipher suites for TLS v1.3. Gorouter only supports the defaults listed in [Default Gorouter Cipher Suites](#).

To support TLS v1.3, ensure the Gorouter is configured with certificates generated with a key larger than 512 bits.

## TLS v1.2

The following cipher suites are optionally supported for TLS v1.2 only:

RFC	OpenSSL
TLS_RSA_WITH_AES_128_GCM_SHA256	AES128-GCM-SHA256
TLS_RSA_WITH_AES_256_GCM_SHA384	AES256-GCM-SHA384
TLS_ECDHE_ECDSA_WITH_RC4_128_SHA	ECDHE-ECDSA-RC4-SHA
TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA	ECDHE-ECDSA-AES128-SHA
TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA	ECDHE-ECDSA-AES256-SHA
TLS_ECDHE_RSA_WITH_RC4_128_SHA	ECDHE-RSA-RC4-SHA
TLS_ECDHE_RSA_WITH_3DES_EDE_CBC_SHA	ECDHE-RSA-DES-CBC3-SHA
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA	ECDHE-RSA-AES128-SHA
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA	ECDHE-RSA-AES256-SHA
TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	ECDHE-RSA-AES128-GCM-SHA256
TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256	ECDHE-ECDSA-AES128-GCM-SHA256
TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	ECDHE-RSA-AES256-GCM-SHA384
TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384	ECDHE-ECDSA-AES256-GCM-SHA384
TLS_RSA_WITH_AES_128_CBC_SHA256	AES128-SHA256

RFC	OpenSSL
TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	ECDHE-ECDSA-AES128-SHA256
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256	ECDHE-RSA-AES128-SHA256
TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305	ECDHE-RSA-CHACHA20-POLY1305
TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305	ECDHE-ECDSA-CHACHA20-POLY1305

## TLS v1.0 and v1.1

The following cipher suites are optionally supported for TLS v1.0 and TLS v1.1 only:

RFC	OpenSSL
TLS_RSA_WITH_RC4_128_SHA	RC4-SHA
TLS_RSA_WITH_3DES_EDE_CBC_SHA	DES-CBC3-SHA
TLS_RSA_WITH_AES_128_CBC_SHA	AES128-SHA
TLS_RSA_WITH_AES_256_CBC_SHA	AES256-SHA

You can override the default cipher suites in the **Networking** pane of the TAS for VMs tile. For more information about using custom SSL ciphers, see [Gorouter Only](#) or [Load balancer and Gorouter](#).

For more information about supported ciphers, see [Golang Constants](#) in the Golang repository on GitHub and [Ciphers](#) in the OpenSSL documentation.



ECDSA ciphers require a certificate and key for DSA, as opposed to RSA.

## Mutual authentication with clients

The Gorouter supports validation of client certificates in TLS handshakes with clients, also known as mutual authentication. Operators can choose whether the Gorouter requests client certificates and when requesting certificates, whether or not to require them.

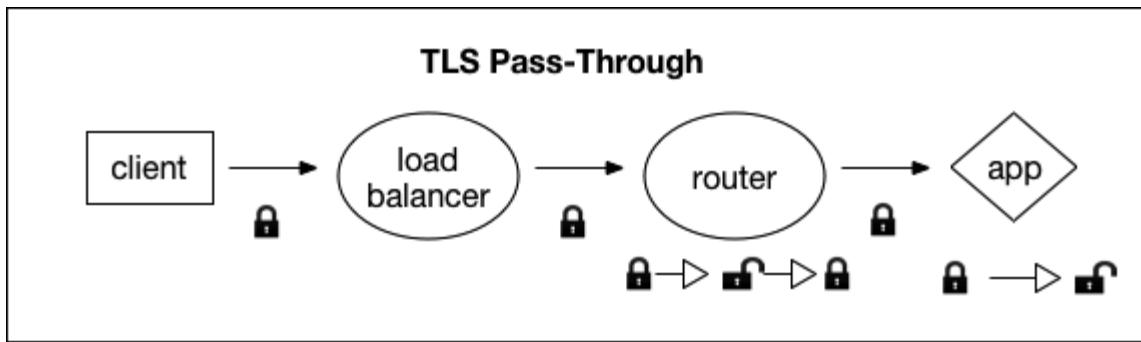
By default, the Gorouter requests but does not require client certificates in TLS handshakes.

## Terminating TLS at the Gorouter only

In this configuration, the load balancer does not terminate TLS for TAS for VMs domains at all. Instead, it passes through the underlying TCP connection to the Gorouter.

VMware recommends this more performant option, establishing and terminating a single TLS connection.

The following diagram illustrates communication between the client, load balancer, Gorouter, and app.



The preceding diagram shows communication between the client, load balancer, router, and the app.

Traffic passes from the encrypted client, to the load balancer, to the router, and traffic ends at the app.

Traffic between the load balancer and the Gorouter is encrypted only if the client request is encrypted.

Traffic between the Gorouter and app is encrypted with TLS, unless a Windows stemcell is being used.

## About HTTP header forwarding

If you stop TLS at the Gorouter only, your load balancer does not send HTTP headers.

The Gorouter appends the `X-Forwarded-For` and `X-Forwarded-Proto` headers to requests forwarded to apps and platform system components.

`X-Forwarded-For` is set to the IP address of the source. Depending on the behavior of your load balancer, this can be the IP address of your load balancer. For the Gorouter to deliver the IP address of the client to apps, configure your load balancer to forward the IP address of the client or configure your load balancer to send the client IP address using the PROXY protocol.

`X-Forwarded-Proto` provides the scheme of the HTTP request from the client. The scheme is HTTP if the client made a request on port 80 (unencrypted) or HTTPS if the client made a request on port 443 (encrypted). The Gorouter sanitizes the `X-Forwarded-Proto` header based on the settings of the `router.sanitize_forwarded_proto` and `router.force_forwarded_proto_https` manifest properties as follows:

- `router.sanitize_forwarded_proto: true` and  
`router.force_forwarded_proto_https: true`: The Gorouter sets the value of `X-Forwarded-Proto` header to `HTTPS` in requests forwarded to back ends.
- `router.sanitize_forwarded_proto: true` and  
`router.force_forwarded_proto_https: false`: The Gorouter strips the `X-Forwarded-Proto` header when present in requests from front end clients. When the request is received on port 80 (unencrypted), the Gorouter sets the value of this header to `HTTP` in requests forwarded to back ends. When the request is received on port 443 (encrypted), the Gorouter sets the value of this header to `HTTPS`.
- `router.sanitize_forwarded_proto: false` and  
`router.force_forwarded_proto_https: true`: The Gorouter passes through the header as received from the load balancer, without modification.

- `router.sanitize_forwarded_proto: false` and  
`router.force_forwarded_proto_https: false`: The Gorouter passes through the header as received from the load balancer, without modification.

If you configured TLS to stop at the Gorouter only, VMware recommends setting `router.sanitize_forwarded_proto: true` and `router.force_forwarded_proto_https: false` to secure against header spoofing.

For more information about HTTP headers in TAS for VMs, see [HTTP Headers in HTTP Routing](#).

For more information about configuring the forwarding of client certificates, see [Forward Client Certificate to Apps](#) in [HTTP Routing](#).

## Procedure: Gorouter only

To configure TLS termination on the Gorouter in TAS for VMs:

1. Configure your load balancer to pass through TCP requests from the client to the Gorouter.
2. Go to Tanzu Operations Manager Installation Dashboard.
3. Click the TAS for VMs tile.
4. Select **Networking**.
5. For TAS for VMs deployments on OpenStack or vSphere:
  1. Choose IP addresses for the Gorouters from the subnet configured for Tanzu Operations Manager.
  2. In **Gorouter IPs**, enter the IP addresses you chose in the previous step.
  3. Configure your load balancer to forward requests for the preceding domains to the IP addresses you configured in the previous step. For more information, see [Configure networking in Networking TAS for VMs](#).
6. In **Certificates and private keys**:
  1. Click **Add** to define at least one certificate and key pair for the Gorouter.
  2. For each certificate keypair that you add, assign a name, enter the PEM-encoded certificate chain and PEM-encoded private key. You can either upload your own certificate or generate an RSA certificate in TAS for VMs. To create a certificate for your wildcard domains, see [Creating a wildcard Certificate for Operations Manager deployments](#) in *providing a certificate for your TLS termination point*.
7. For **TLS versions**, select the minimum version of TLS to use in Gorouter communications. The Gorouter uses TLS v1.2 by default. If you need to accommodate clients that use an older version of TLS, select a lower minimum version. For a list of TLS ciphers supported by the Gorouter, see [Cipher suites](#).
8. To use a specific set of TLS ciphers for the Gorouter, enter an ordered, colon-separated list of TLS cipher suites in OpenSSL format in **TLS cipher suites**. For example, if you have selected support for an earlier version of TLS, enter cipher suites supported by this version. For a list of TLS ciphers that the Gorouter supports, see [Cipher suites](#). Otherwise, leave the default values in this field.
9. In **TLS termination point**, select **Gorouter**.

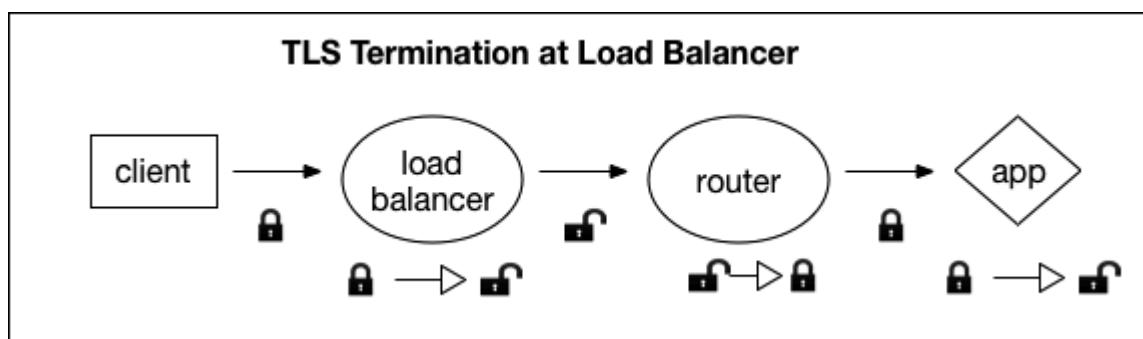
10. (Optional) If you do not want the Gorouter to accept any non-encrypted HTTP traffic, select the **Reject HTTP requests** check box.
11. Click **Save**.
12. Select **Resource Config**.
13. Click **Save**.

## Stopping TLS at the load balancer only

In this configuration, your load balancer terminates TLS and passes unencrypted traffic to the Gorouter, which routes it to your app. Traffic between the load balancer and the Gorouter is not encrypted.

VMware recommends this option if you cannot use SAN certificates and if you do not require traffic to be encrypted between the load balancer and the Gorouter.

The following diagram illustrates communication between the client, load balancer, Gorouter, and app.



The preceding diagram shows configuration of the the client, load balancer, Gorouter, and app when the TLS terminates at the load balancer with lock icons.

Traffic starts at the encrypted client, passes through the load balancer to the router, and terminates at the app. Traffic is not encrypted past the load balancer.

Traffic between the Gorouter and app is encrypted with TLS, unless a Windows stemcell is being used.

## About HTTP header forwarding

If you stop TLS at your load balancer, you must also configure the load balancer to append the `X-Forwarded-For` and `X-Forwarded-Proto` HTTP headers to the HTTP traffic it passes to the Gorouter.

For more information about HTTP headers in TAS for VMs, see [HTTP Headers in \*HTTP Routing\*](#). If you are configuring the forwarding of client certificates, see [Forward Client Certificate to Apps in \*HTTP Routing\*](#).

## Procedure: Load balancer only

To configure SSL termination on the load balancer only in TAS for VMs:

1. Create an A record in your DNS that points to your load balancer IP address. The A record associates the **System domain** and **Apps domain** that you configure in the **Domains** pane of the TAS for VMs tile with the IP address of your load balancer.

For example, with `pcf.example.com` as the main subdomain for your Operations Manager deployment and a load balancer IP address `198.51.100.1`, you must create an A record in your DNS that serves `example.com` and points `*.pcf` to `198.51.100.1`.

Name	Type	Data	Domain
<code>*.pcf</code>	A	<code>198.51.100.1</code>	<code>example.com</code>

2. Navigate to the Tanzu Operations Manager Installation Dashboard.
3. Click the TAS for VMs tile.
4. Select **Networking**.
5. For TAS for VMs deployments on OpenStack or vSphere:
  1. Choose IP addresses for the Gorouters from the subnet configured for Tanzu Operations Manager.
  2. In **Gorouter IPs**, enter the IP addresses you chose in the previous step.
  3. Configure your load balancer to forward requests for the above domains to the IP addresses you configured in the previous step. For more information, see [Configure networking in Networking TAS for VMs](#).
6. Under **Certificates and private keys**:
  1. Click **Add** to define at least one certificate and key pair for the Gorouter.
  2. For each certificate keypair that you add, assign a name, enter the PEM-encoded certificate chain and PEM-encoded private key. You can either upload your own certificate or generate an RSA certificate in TAS for VMs. To create a certificate for your wildcard domains, see [Creating a wildcard certificate for Operations Manager Deployments](#) in *providing a certificate for your TLS termination point*.
7. For **TLS versions**, select the minimum version of TLS to use in Gorouter communications. The Gorouter uses TLS v1.2 by default. If you need to accommodate clients that use an older version of TLS, select a lower minimum version. For a list of TLS ciphers supported by the Gorouter, see [Cipher suites](#).
8. To use a specific set of TLS ciphers for the Gorouter, enter an ordered, colon-separated list of TLS cipher suites in OpenSSL format in **TLS cipher suites**. For example, if you have selected support for an earlier version of TLS, enter cipher suites supported by this version. For a list of TLS ciphers that the Gorouter supports, see [Cipher suites](#). Otherwise, leave the default values in this field.
9. In **TLS termination point**, select **Infrastructure load balancer**.
10. (Optional) If you do not want the Gorouter to accept any non-encrypted HTTP traffic, select the **Reject HTTP requests** check box.
11. Click **Save**.

12. After you finish configuring TAS for VMs, add your certificate or certificates to your load balancer and configure its listening port. The procedures vary depending on your IaaS.
13. Configure your load balancer to append the `X-Forwarded-For` and `X-Forwarded-Proto` headers to client requests.

If you cannot configure the load balancer to provide the `X-Forwarded-For` header, the Gorouter appends it in requests forwarded to apps and system components, set to the IP address of the load balancer.

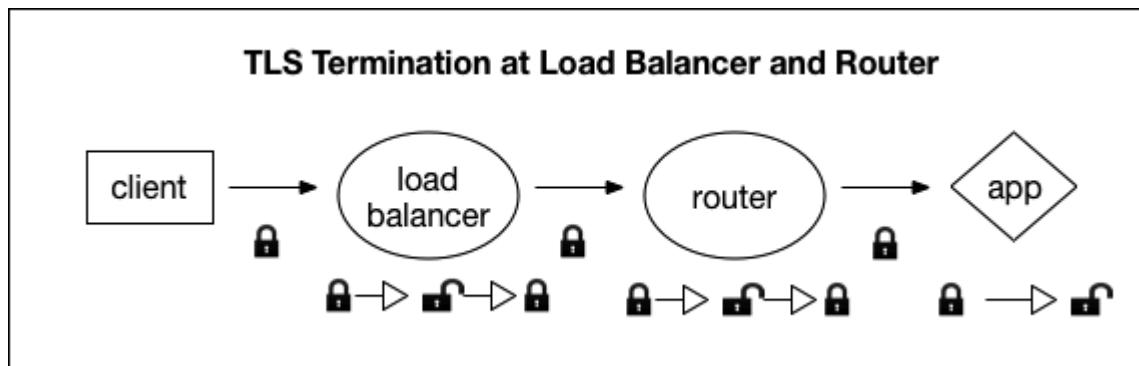


If the load balancer accepts unencrypted requests, it **must** provide the `X-Forwarded-Proto` header. Conversely, if the load balancer cannot be configured to send the `X-Forwarded-Proto` header, it must not accept unencrypted requests. Otherwise, apps and platform system components that require encrypted client requests accept unencrypted requests when they must not accept them.

## Terminating TLS at the load balancer and Gorouter

In this configuration, two TLS connections are established: one from the client to the load balancer, and another from the load balancer to the Gorouter. This configuration secures all traffic between the load balancer and the Gorouter.

The following diagram illustrates communication between the client, load balancer, Gorouter, and app.



Traffic starts at the encrypted client, moves through the load balancer to the router, and terminates at the unencrypted app. Traffic is encrypted between the client and load balancer, and between the load balancer and router.

This option is less performant, but allows for termination at a load balancer, as well as secure traffic between the load balancer and the Gorouter.

Traffic between the Gorouter and app is encrypted with TLS, unless a Windows stemcell is being used.

## Certificate guidelines

In this deployment scenario, the following guidelines apply:

- Certificates for the TAS for VMs domains must be stored on the load balancer, as well as on the Gorouter.

- Generate certificates for your load balancer and the Gorouter with different keys. If the key for the certificate on the Gorouter is compromised, then the certificate on the load balancer is not at risk, and vice-versa.
- If you choose to host only one certificate on the Gorouter and many on your load balancer, configure your load balancer with the CA and host name with which to validate the certificate hosted by the Gorouter.

## About host name verification

Host name verification between the load balancer and the Gorouter is unnecessary when the load balancer is already configured with the Gorouter's IP address to correctly route the request.

If the load balancer uses DNS resolution to route requests to the Gorouters, then you should enable host name verification.

## About HTTP header forwarding

If you terminate TLS at your load balancer, you must configure the load balancer to append the `X-Forwarded-For` and `X-Forwarded-Proto` HTTP headers to requests it sends to the Gorouter.

If you terminate TLS at your load balancer but it does not support HTTP, such that it cannot append HTTP headers, a workaround exists. You should use this workaround **only if your load balancer does not accept unencrypted requests**. Configure your load balancer to send the client IP address using the PROXY protocol, and enable PROXY in the Gorouter. As the `X-Forwarded-Proto` header is stripped, configure the Gorouter to force-set this header to 'HTTPS'.

For more information about HTTP headers in TAS for VMs, see [HTTP Headers in \*HTTP Routing\*](#). If you are configuring the forwarding of client certificates, see [Forward Client Certificate to Apps in \*HTTP Routing\*](#).

## Procedure: Load balancer and Gorouter

To configure TLS termination on the Gorouter and load balancer in TAS for VMs:

1. Create an A record in your DNS that points to your load balancer IP address. The A record associates the **System domain** and **Apps domain** that you configure in the **Domains** pane of the TAS for VMs tile with the IP address of your load balancer.

For example, with `pcf.example.com` as the main subdomain for your Operations Manager deployment and a load balancer IP address `198.51.100.1`, you must create an A record in your DNS that serves `example.com` and points `*.pcf` to `198.51.100.1`.

Name	Type	Data	Domain
<code>*.pcf</code>	A	<code>198.51.100.1</code>	<code>example.com</code>

2. Go to Tanzu Operations Manager Installation Dashboard.
3. Click the TAS for VMs tile.
4. Select **Networking**.
5. For TAS for VMs deployments on OpenStack or vSphere:

1. Choose IP addresses for the Gorouters from the subnet configured for Tanzu Operations Manager.
  2. In **Gorouter IPs**, enter the IP addresses you chose in the previous step.
  3. Configure your load balancer to forward requests for the preceding domains to the IP addresses you configured in the previous step. For more information, see [Networking](#).
6. Under **Certificates and private keys**:
1. Click **Add** to define at least one certificate and key pair for the Gorouter.
  2. For each certificate keypair that you add, assign a name, enter the PEM-encoded certificate chain and PEM-encoded private key. You can either upload your own certificate or generate an RSA certificate in TAS for VMs. To create a certificate for your wildcard domains, see [Creating a wildcard certificate for Operations Manager deployments](#) in *providing a certificate for your TLS termination point*.
7. For **TLS versions**, select the minimum version of TLS to use in Gorouter communications. The Gorouter uses TLS v1.2 by default. If you need to accommodate clients that use an older version of TLS, select a lower minimum version. For a list of TLS ciphers supported by the Gorouter, see [Cipher Suites](#).
8. To use a specific set of TLS ciphers for the Gorouter, enter an ordered, colon-separated list of TLS cipher suites in OpenSSL format in **TLS cipher suites**. For example, if you have selected support for an earlier version of TLS, enter cipher suites supported by this version. For a list of TLS ciphers that the Gorouter supports, see [Cipher Suites](#). Otherwise, leave the default values in this field.
9. Under **TLS termination point**, select any of the available options depending on your client app needs. For more information about XFCC header forwarding, see [Forward Client Certificate to Apps](#) in *HTTP Routing*.
10. (Optional) If you do not want the Gorouter to accept any non-encrypted HTTP traffic, select the **Reject HTTP requests** check box.
11. Click **Save**.
12. After you finish configuring TAS for VMs, add your certificate or certificates to your load balancer and configure its listening port. The procedures vary depending on your IaaS.
13. Configure your load balancer to append the `X-Forwarded-For` and `X-Forwarded-Proto` headers to client requests.  
If you cannot configure the load balancer to provide the `X-Forwarded-For` header, the Gorouter appends it in requests forwarded to apps and system components, set to the IP address of the load balancer.



If the load balancer accepts unencrypted requests, it **must** provide the `X-Forwarded-Proto` header. Conversely, if the load balancer cannot be configured to send the `X-Forwarded-Proto` header, it must not accept unencrypted requests. Otherwise, apps and platform system components

that require encrypted client requests accept unencrypted requests when they must not accept them.

## Configuring SSH access for TAS for VMs

TAS for VMs supports SSH access into running apps to help troubleshoot apps hosted by a deployment.

You can configure a TAS for VMs deployment to allow SSH access to app instances, and configure load balancing for those app SSH sessions.

### Configure TAS for VMs SSH access

You can configure TAS for VMs to activate or deactivate deployment wide SSH access to app instances. In addition to this deployment wide configuration, Space Managers have SSH access control over their Space, and Space Developers have SSH access control to their apps. For details about SSH access permissions, see [App SSH Overview](#).

To configure TAS for VMs SSH access for app instances:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **App Containers**.
4. Activate or deactivate the **Allow SSH access to app containers** check box.
5. Optionally, select the **Allow SSH when an app is created** check box to activate SSH access for new apps by default in spaces that permit SSH. If you deselect this check box, developers can still activate SSH after pushing their apps by running `cf enable-ssh APP-NAME`, where `APP-NAME` is the name of the app for which they want to enable SSH.

### Configure an SSH load balancer

For IaaSes where load balancing is available as a service, you can provision a load balancer to balance load across SSH proxy instances. Configure this load balancer to forward incoming TCP traffic on port 2222 to a target pool where you deploy `diego_brain` instances.

For AWS, Azure, and GCP IaaSes, you configure SSH load balancers in the **Resource Config** pane. To register SSH proxies with a load balancer:

1. Select **Resource Config**.
2. Expand the row for the job that handles SSH requests. This depends on the TAS for VMs release you are using:
  - **TAS for VMs**: Click the icon next to **Diego Brain**.
  - **Small Footprint TAS for VMs**: Click the icon next to **Control**.
3. Enter your load balancer name in the **Load Balancers** field.

Tanzu Operations Manager supports an API-only `nsx_lbs` field. You can configure load balancers in vSphere using this field.

# App SSH components and processes

This topic tells you about the VMware Tanzu Application Service for VMs (TAS for VMs) SSH components that are used for access to deployed app instances. TAS for VMs supports native SSH access to apps and load balancing of SSH sessions with the load balancer for your TAS for VMs deployment.

For procedural and configuration information about app SSH access, see [SSH Overview](#).

## SSH components

TAS for VMs SSH includes two central components: an implementation of an SSH proxy server and a lightweight SSH daemon. If these components are deployed and configured correctly, they provide a simple and scalable way to access containers apps and other long-running processes (LRPs).

### SSH daemon

SSH daemon is a lightweight implementation that is built around the Go SSH library. It supports command execution, interactive shells, local port forwarding, and secure copy. The daemon is self-contained and has no dependencies on the container root file system.

The daemon is focused on delivering basic access to app instances in TAS for VMs. It is intended to run as an unprivileged process, and interactive shells and commands run as the daemon user. The daemon only supports one authorized key, and it is not intended to support multiple users.

The daemon is available on a file server and Diego LRPs that want to use it can include a download action to acquire the binary and a run action to start it. TAS for VMs apps download the daemon as part of the lifecycle bundle.

### SSH proxy authentication

The SSH proxy hosts the user accessible SSH endpoint and is responsible for authentication, policy enforcement, and access controls in the context of TAS for VMs. After you successfully authenticate with the proxy, the proxy attempts to locate the target container and create an SSH session to a daemon running inside the container. After both sessions have been established, the proxy manages the communication between your SSH client and the container SSH Daemon.

## Configuring front end idle timeout for Gorouter

You can configure the **Front end idle timeout** field in the **Networking** pane of the VMware Tanzu Application Service for VMs (TAS for VMs) tile.

You can use the **Front end idle timeout** field if you want to prevent connections from your load balancer to the Gorouter from being closed prematurely. The value you enter sets the duration, in seconds, that the Gorouter maintains an idle open connection from a load balancer that supports keep-alive.

As a general rule, set the value higher than your load balancer's back end idle timeout to avoid the race condition in which the load balancer sends a request before it discovers that the Gorouter has closed the connection.

For specific guidance and exceptions to this rule, see the following table:

<b>IaaS Guidance</b>	
AWS	AWS ELB has a default timeout of 60 seconds, so VMware recommends a value greater than <a href="#">60</a> .
Azur e	By default, Azure load balancer times out at 240 seconds without sending a TCP RST to clients, so as an exception, VMware recommends a value lower than <a href="#">240</a> to force the load balancer to send the TCP RST.
GCP	GCP has a default timeout of 600 seconds. For GCP HTTP load balancers, VMware recommends a value greater than <a href="#">600</a> . For GCP TCP load balancers, VMware recommends a value less than <a href="#">600</a> to force the load balancer to send a TCP RST.
Other	Set the timeout value to be greater than that of the load balancer's back end idle timeout.

## Load balancing and routing

In this section:

- [Using your own load balancer](#)
- [Enabling and Configuring TCP Routing](#)
- [Enabling IPv6 for hosted apps](#)
- [Supporting HTTP/2](#)
- [Configuring proxy settings for all apps](#)
- [Switching app domains](#)
- [TLS connections in TAS for VMs](#)
- [Configuring load balancer health checks for TAS for VMs routers](#)
- [Configuring route service lookup](#)
- [Configuring delayed job priorities with Cloud Controller](#)

## Using your own load balancer

You can use a load balancer and forward traffic to your VMware Tanzu Application Service for VMs (TAS for VMs) router IP address.

TAS for VMs includes a tier of reverse proxies that dynamically track the location of app containers and system components, enabling routing of requests to those endpoints even as IPs and ports change.

## Why you need a load balancer

For the TAS for VMs routers to be horizontally scalable and highly available, a load balancer must be deployed in front of them. The simplest solution is to use a Layer 4 TCP load balancer, provided by your IaaS or IT team, which passes all HTTP and TLS handling to the TAS for VMs routers. For more information about TLS termination, see [Securing Traffic into TAS for VMs](#). For a description of features supported by the TAS for VMs routing tier, see [HTTP Routing](#).

If you have requirements that are not fulfilled by the TAS for VMs routers alone, you can choose to use your own Layer 7 load balancer provided by your IaaS or IT team.

If you use your own Layer 7 load balancer, it must fulfill the following requirements:

- Provides load balancing to each of the TAS for VMs router IP addresses.
- Supports TLS termination for wildcard hostnames.
- Adds appropriate `x-forwarded-for` and `x-forwarded-proto` HTTP headers to incoming requests.
- Sets an HTTP keepalive connection timeout greater than five seconds.
- (Optional) Supports WebSocket.

The choice to use your own load balancer depends on what features you need out of a load balancer, and whether you want the ability to configure it yourself. App logging with Loggregator requires WebSocket. To use another logging service, see [Streaming App Logs to Log Management Services](#).

For information about how to install an F5 Local Traffic Manager (LTM) as a load balancer for Tanzu Operations Manager and TAS for VMs, see [Configuring an F5 Load Balancer for TAS for VMs](#). For more information about F5 LTM, see the [F5 documentation](#).

## Integrate your own load balancer

Use the following procedure to use your own load balancer.

### Prerequisites

To integrate your own load balancer with TAS for VMs, you must ensure:

- WebSocket connections are not blocked for Loggregator functionality.
- The load balancer must be able to reach the Gorouter IP addresses.

### Step 1: Deploy Tanzu Operations Manager installation VM

Deploy an Tanzu Operations Manager Installation VM. For more information, see [Deploying Tanzu Operations Manager on vSphere](#).

### Step 2: Register Tanzu Operations Manager IP address

In your load balancer, register the IP addresses that you assigned to Tanzu Operations Manager.

### Step 3: Configure Tanzu Operations Manager and BOSH Director

Configure Tanzu Operations Manager and the BOSH Director as described in [Configuring BOSH Director on vSphere](#), then add TAS for VMs.

Do not click **Install** after adding TAS for VMs.

### Step 4: Configure networking

Configure the **Networking** pane in TAS for VMs. Load balancer configuration in TAS for VMs varies depending on which IaaS you are using for Tanzu Operations Manager. For more information, see [Configure Networking](#) in [Configuring TAS for VMs](#).

### Step 5: Finalize changes

To finalize the changes to your deployment:

1. Return to the Tanzu Operations Manager Installation Dashboard.
2. Click **Install**.

## Enabling and configuring TCP routing in TAS for VMs

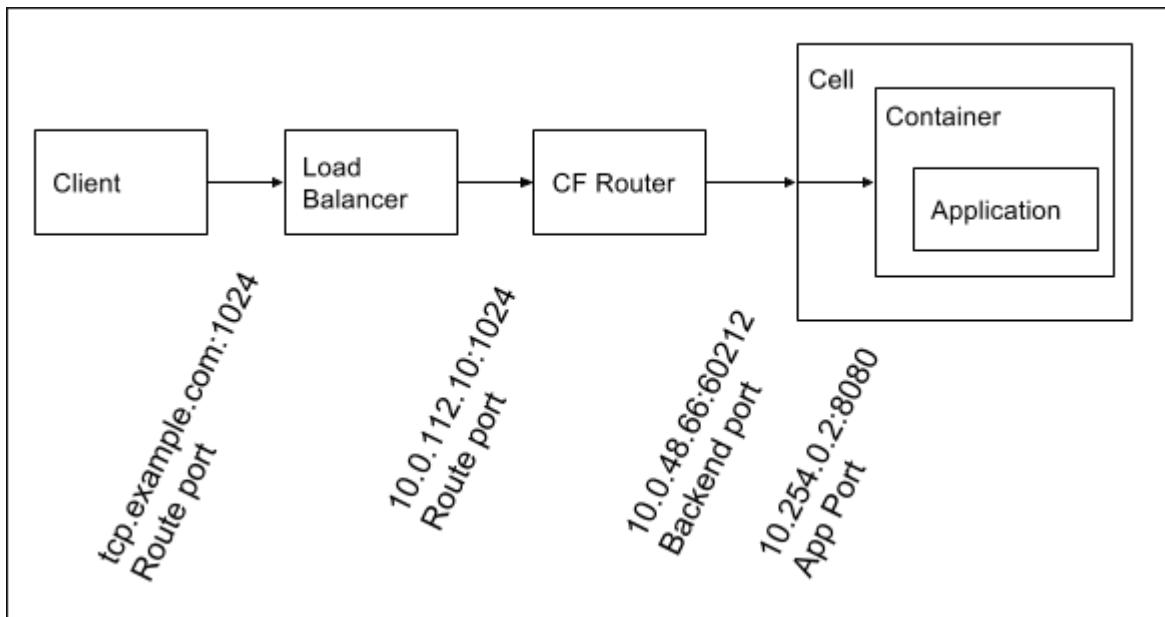
You can enable TCP routing in TAS for VMs. Learn about TCP routing and go through the steps of enabling and configuring it.

### TCP routing overview

You can use TCP routing to run apps that serve requests on non-HTTP TCP protocols. You can use TCP routing to comply with regulatory requirements to stop TLS as close to apps as possible so that packets are not decrypted before reaching the app level.

### TCP routing architecture

The following diagram shows the layers of network address translation that occur in VMware Tanzu Application Service for VMs (TAS for VMs) in support of TCP routing.



The following example workflow ships with route ports, back end ports, and app ports:

1. You create a TCP route for your app based on a TCP domain and a route port, and map this route to one or more apps. See [Create a Route](#) in *Configuring Routes and Domains*.
2. Clients make requests to the route. DNS resolves the domain name to the load balancer.
3. The load balancer listens on the port and forwards requests for the domain to the TCP routers. The load balancer must listen on a range of ports to support multiple TCP route creation. Additionally, TAS for VMs must be configured with this range, so that the platform knows which ports can be reserved when you create TCP routes.
4. The TCP router can be dynamically configured to listen on the port when the route is mapped to an app. The domain the request was originally sent to is no longer relevant to the routing of the request.

to the app. The TCP router keeps a dynamically updated record of the back ends for each route port. The back ends represent instances of an app mapped to the route. The TCP router chooses a back end using a round-robin load balancing algorithm for each new TCP connection from a client. Because the TCP router is protocol-agnostic, it does not recognize individual requests, only TCP connections. All client requests transit the same connection to the selected back end until the client or back end closes the connection. Each subsequent connection initiates the selection of a back end.

5. Because containers each have their own private network, the TCP router does not have direct access to app containers. When a container is created for an app instance, a port on the Diego Cell VM is randomly chosen and iptables are configured to forward requests for this port to the internal interface on the app container. The TCP router then receives a mapping of the route port to the Diego Cell IP and port.
6. By default, the Diego Cell only routes requests to port `8080`, the app port, on the app container internal interface. The app port is the port on which apps must listen. Developers can use the Cloud Controller API to update the ports an app can receive requests on.

For more information, see [Configuring Apps to Listen on Custom Ports \(Beta\)](#).

## Prerequisites for activating TCP routing



If you have mutual TLS app identity verification enabled, app containers accept incoming communication only from the Gorouter. This deactivates TCP routing. For more information, see [TLS to Apps and Other Back End Services in HTTP Routing](#).

Before you activate TCP routing, you must set up networking requirements.

To set up networking requirements:

1. Choose a domain from which you can create TCP routes for your apps. For example, create a domain which is similar to your app domain but prefixed by the TCP subdomain, such as `tcp.APP-DOMAIN.com`, where `APP-DOMAIN` is the name of your app domain.
2. Configure DNS to resolve this domain name to the IP address of a highly available load balancer that can forward traffic for the domain to the TCP routers. For more information, see [Domains in Configuring Routes and Domains](#). If you are operating an environment that does not require high availability, configure DNS to resolve the TCP domain name you have chosen directly to a single instance of the TCP router.
3. (Optional) Choose IP addresses for the TCP routers and configure your load balancer to forward requests for the domain you chose in the first step above to these addresses. Skip this step if you have configured DNS to resolve the TCP domain name to an instance of the TCP router. To configure your IP addresses for your TAS for VMs deployment, follow the procedure for enabling TCP routing in [Configure Networking](#) in [Configuring TAS for VMs](#).
4. (Optional) Decide how many TCP routes you want to support. For each TCP route, you must reserve a port. Configure your load balancer to forward the range of ports to the TCP routers. Skip this step if you have configured DNS to resolve the TCP domain name to an instance of the TCP router. For more information about configuring port reservations, see [Modify TCP Port Reservations](#).

- To configure your ports for your TAS for VMs deployment, enable TCP routing in TAS for VMs. For more information, see [Configure networking in Networking TAS for VMs](#).

## Enable TCP routing

To configure TCP routing:

- Go to the Tanzu Operations Manager Installation Dashboard.
- Click the **VMware Tanzu Application Service for VMs** tile.
- Select **Networking**.
- In **TCP routing**, click **Allow**.
- For **TCP router IPs**, enter the IP addresses to assign to the TCP routers as multiple values as a comma-separated list or as a range. For example, `10.254.0.1`, `10.254.0.2` or `10.254.0.1-10.254.0.2`. These addresses must be within your subnet CIDR block. The addresses are the same IP addresses with which you configured your load balancer in [Prerequisites for configuring TCP routing](#), unless you configured DNS to resolve the TCP domain name directly to an IP for the TCP router.
- For **TCP routing ports**, enter one or more ports to which the load balancer forwards requests. To support multiple TCP routes, VMware recommends allocating multiple ports. To configure this field, choose one of the following options:
  - To allocate a single port or range of ports, enter a single port or a range of ports.



If you configured AWS for TAS for VMs manually, enter `1024-1123`. This range of ports corresponds to the rules you created for `-tcp-elb`.

- To allocate a list of ports:
    - Enter a single port.
    - After deploying TAS for VMs, follow the procedure in [Modify TCP port reservations](#) below to add TCP routing ports through the cf CLI.
- (Optional) For **TCP request timeout**, enter in seconds the amount of time until the TCP router closes idle connections from clients to apps that use TCP routes. The default value is `300`. You might want to increase this value to allow developers to push apps that require long-running idle connections with clients.
  - For AWS, Azure, or GCP Operations Manager deployments, add the name of your load balancer to the **TCP Router** field in the **Resource Config** pane of the TAS for VMs tile. For more information, see [Configuring load balancing for TAS for VMs](#).

## Configure TCP routing after deploying TAS for VMs

After you activate TCP routing and deploy TAS for VMs, you must add the TCP shared domain and configure org quotas that allow you to create TCP routes. To do this, you must use the Cloud Foundry Command Line Interface (cf CLI) and have an admin user account.

For more information about the cf CLI, see [Using the Cloud Foundry Command Line Interface \(cf CLI\)](#).

## Configure TAS for VMs with your TCP Domain

After you deploy TAS for VMs, you must configure TAS for VMs with the domain that you configured in [Prerequisites for Enabling TCP Routing](#).

This is the domain from which developers create TCP routes.

To configure TAS for VMs with your TCP domain:

1. To list your router groups, run:

```
cf router-groups
```

You must see `default-tcp` as a response.

2. Create a shared domain and associate it with the `default-tcp` router group by running:

```
cf create-shared-domain tcp.APP-DOMAIN.com --router-group default-tcp
```

Where `APP-DOMAIN` is the name of your app domain.

3. Verify that `TCP` appears under `type` next to your TCP domain by running:

```
cf domains
```

## Configure a quota for TCP routes

Because TCP route ports are a limited resource in some environments, quotas are configured to allow creation of zero TCP routes by default. After you deploy TAS for VMs, you can increase the maximum number of TCP routes for all orgs or for particular orgs and spaces. Because you reserve a route port for each TCP route, you manage the quota for route ports using the `--reserved-route-ports` cf CLI command option.

For more information, see [Creating and Modifying Quota Plans](#).

You can configure quotas for TCP routes in the following ways:

- If you have a default quota that applies to all orgs, you can update it to configure the number of route ports that can be reserved by each org by running:

```
cf update-org-quota QUOTA --reserved-route-ports NUMBER-OF-ROUTE-PORTS
```

Where:

- `QUOTA` is the maximum number of TCP routes you want to allocate to all orgs.
- `NUMBER-OF-ROUTE-PORTS` is the number of route ports you want to allow each org to reserve.
- To create a new quota that governs the number of route ports that can be created in a particular org:
  1. Target the org for which you want to create the quota by running:

```
cf target -o ORG-NAME
```

Where `ORG-NAME` is the name of the org for which you want to create the quota.

2. Run:

```
create-org-quota QUOTA --reserved-route-ports NUMBER-OF-ROUTE-PORTS
```

Where:

- `QUOTA` is the maximum number of TCP routes you want to allocate to particular orgs.
- `NUMBER-OF-ROUTE-PORTS` is the number of route ports you want to allow each org to reserve.
- To create a new quota that governs the number of route ports that can be created in a particular space:

1. Target the space to create the quota by running:

```
cf target -s SPACE-NAME
```

Where `SPACE-NAME` is the name of the space for which you want to create the quota.

2. Run:

```
cf create-space-quota QUOTA --reserved-route-ports NUMBER-OF-ROUTE-PORTS
```

Where:

- `QUOTA` is the maximum number of TCP routes you want to allocate to a particular space.
- `NUMBER-OF-ROUTE-PORTS` is the number of route ports you want to allow the space to reserve.

## Create a TCP route

For information about creating a TCP route, see [Create a TCP Route with a Port](#) in *Configuring Routes and Domains*.

## Modify TCP port reservations

After deploying TAS for VMs, you can modify the range of ports available for TCP routes using `cf curl` commands, as demonstrated with the following commands. The commands require you to have an admin user account with the `routing.router_groups.read` and `routing.router_groups.write` scopes.

1. In a terminal window, view the `reservable_ports` by running:

```
cf curl /routing/v1/router_groups
```

Record the `guid` from the output.

2. To configure a new port, run:

```
cf curl /routing/v1/router_groups/GUID
```

Where `GUID` is the GUID you recorded in the previous step.

To configure multiple ports, enter a comma-separated list of ports or port ranges by running:

```
cf curl \
-X PUT -d '{"reservable_ports":"PORTS-OR-PORT-RANGES"}' \
/routing/v1/router_groups/f7392031-a488-4890-8835-c4a038a3bded
```

Where `PORTS-OR-PORT-RANGES` is a comma-separated list of ports or port ranges. For example, `"reservable_ports":"1024-1199,1234-1248,1312"`.



Do not enter `reservable_ports` that conflict with other TCP router instances or ephemeral port ranges. VMware recommends using port ranges within `1024-2047` and `18000-32767` on default installations. Check which ports are available on the TCP router VMs to verify that no additional ports are in use. For more information, see [TCP router fails to configure routes when there is a port conflict with a local process](#) in the Routing Release repository on GitHub.

## Deactivate TCP routing

To disallow TCP routing:

1. Go to Tanzu Operations Manager Installation Dashboard.
2. Click the **VMware Tanzu Application Service for VMs** tile.
3. Select **Networking**.
4. Under **TCP routing**, select **Do not allow**.
5. In a terminal window, remove the TCP routing domain by running:

```
cf delete-private-domain DOMAIN
```

Where `DOMAIN` is the name of your TCP routing domain.

## Enabling IPv6 for hosted apps on TAS for VMs

You can enable IPv6 support for hosted apps on TAS for VMs.

The following procedure allows apps deployed to VMware Tanzu Application Service for VMs (TAS for VMs) to be reached using IPv6 addresses.



Amazon Web Services (AWS) EC2 instances do not support IPv6.

TAS for VMs system components use a separate DNS subdomain from hosted apps. These components support only IPv4 DNS resolved addresses. This means that although an IPv6 address can be used for app domains, the system domain must resolve to an IPv4 address.

## Enable IPv6 Support for hosted pps

To enable support for IPv6 app domains:

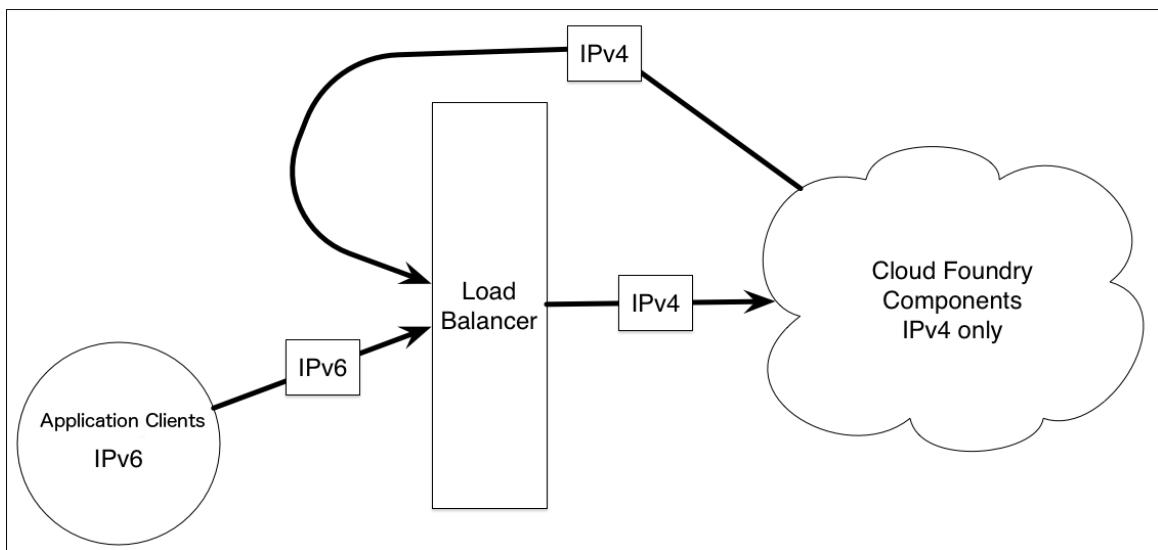
1. Set up an external load balancer for your TAS for VMs deployment. For more information, see [Using your own load balancer](#).

2. Configure DNS to resolve app domains to an IPv6 address on your external load balancer.

Your IPv4 interface for the system domain and IPv6 interface for app domain can be configured on the same or different load balancers.

3. Configure the external load balancer to route requests for an IPv6 address directly to the IPv4 addresses of the Gorouters.

The following diagram illustrates how a single load balancer can support traffic on both IPv4 and IPv6 addresses for a TAS for VMs installation:



For more information about domains in TAS for VMs, see [Routes and Domains](#).

## Configuring HTTP/2 support

You can configure your VMware Tanzu Application Service for VMs (TAS for VMs) deployment to support HTTP/2 from ingress to egress.

### HTTP/2 support overview

For information about how HTTP/2 can benefit apps running on TAS for VMs, see [Routing HTTP/2 and gRPC Traffic to Apps](#).

Apps can benefit from HTTP/2 even if not all network segments use HTTP/2. Headers are compressed and requests are multiplexed for HTTP/2 segments even if other network hops do not use HTTP/2.

However, some features like gRPC require all segments to use HTTP/2. While browsers and other clients might indicate a request is being served over HTTP/2, operators must ensure that all network hops use HTTP/2 to support gRPC.

### Prerequisites

Before you can configure your TAS for VMs deployment to support HTTP/2, you must enable TLS.

Most implementations of HTTP/2 require TLS with Application-Layer Protocol Negotiation (ALPN). For more information about ALPN, see [RFC 7301: Transport Layer Security \(TLS\) Application-Layer Protocol Negotiation Extension](#).

## Security considerations

If you use a firewall or other tools to monitor network traffic, ensure that those tools support HTTP/2 connections. If your network monitoring tools do not support HTTP/2 connections, configuring HTTP/2 can cause problems with protecting and analyzing traffic on your network.

VMware recommends that you become familiar with common vulnerabilities in apps that support HTTP/2. For example, HTTP/1.1 has vulnerabilities such as request smuggling and desync attacks, but these might be more prevalent in HTTP/2 environments.

## Enable end-to-end HTTP/2

This section describes how to enable HTTP/2 in your deployment from ingress to egress. To enable end-to-end HTTP/2, you must configure the load balancers, the TAS for VMs platform, and the app.

### Configure load balancers

To support HTTP/2, operators must configure platform load balancers to enable HTTP/2 ingress and egress.

Load balancers in front of TAS for VMs can be either Layer 4 (TCP) or Layer 7 (Application). Layer 4 load balancers tend to be simpler, while Layer 7 load balancers offer more features by inspecting the contents of HTTP requests. For example, a Layer 7 load balancer might send requests to different TAS for VMs deployments based on the resources that are being requested. You can configure many load balancers to function in either Layer 4 or Layer 7 mode.

For more information, see the following sections:

- [Configure Layer 4 TCP Load Balancers](#)
- [Configure Layer 7 Application Load Balancers](#)

#### Configure layer 4 TCP load balancers

Layer 4 load balancers do not terminate HTTP connections and support passing HTTP/2 traffic.

If you are terminating TLS traffic at a Layer 4 load balancer, configure your load balancer to advertise support for HTTP/2 over ALPN. ALPN ensures that a client making an HTTP request knows that the app server that is servicing the request can support HTTP/2.

If a load balancer terminates TLS without advertising HTTP/2 over ALPN, then clients must be configured to use HTTP/2 with prior knowledge. For more information, see [Starting HTTP/2 with Prior Knowledge](#) in [RFC 7540: Hypertext Transfer Protocol Version 2 \(HTTP/2\)](#).

#### Configure layer 7 application load balancers

Layer 7 load balancers terminate the incoming HTTP connection and initiate new HTTP connections to their back ends. For end-to-end HTTP/2 support, Layer 7 load balancers must have HTTP/2 enabled for both

ingress and egress HTTP connections.

The HAProxy BOSH release contains the canonical example of how to set up HTTP/2 load balancing for TAS for VMs. See the [BOSH release for HAProxy](#) on GitHub.

When HTTP/2 is enabled, HAProxy advertises support for HTTP/2 over ALPN, accepts HTTP/2 ingress traffic for all connections, and negotiates using HTTP/2 over ALPN when connecting to the Gorouter.

Gorouter and many Layer 7 load balancers do not support WebSockets over HTTP/2. For more information, see [RFC 8441](#). TAS for VMs uses WebSockets for streaming logs and metrics as well as apps that serve WebSocket traffic.

To continue supporting WebSockets in TAS for VMs when you enable HTTP/2, you can do either of the following:

- Configure load balancers to forward WebSocket traffic over HTTP/1.1.
- Use a Layer 4 load balancer for WebSocket traffic.

For more information, see [Supporting WebSockets](#).

## Configure the TAS for VMs platform

In TAS for VMs v2.12 and later, HTTP/2 support is enabled by default. To deactivate HTTP/2 support, set the `router.enable_http2` property to `false`.

When HTTP/2 is enabled, the Gorouter accepts HTTP/2 ingress traffic for all apps, but does not connect to app instances over HTTP/2 unless configured on app routes.

## Configure TAS for VMs apps

Before the Gorouter can send HTTP/2 traffic to apps, the operator must configure HTTP/2 when mapping the route to the app. This is because the Gorouter defaults to HTTP/1.1 for compatibility unless it knows that a given route and app combination supports HTTP/2.

After you map a route with HTTP/2 support enabled, the Gorouter sends all traffic to that app over HTTP/2, even traffic that ingresses to the Gorouter over HTTP/1.1.

To map a route to the app with HTTP/2 support:

1. Log in to the Cloud Foundry Command Line Interface (cf CLI) by running:

```
cf login -a API-URL -u USERNAME -p PASSWORD -o ORG -s SPACE
```

Where:

- `API-URL` is your API endpoint, the URL of the Cloud Controller in your TAS for VMs instance.
- `USERNAME` is your username.
- `PASSWORD` is your password. VMware discourages using the `-p` option, as it might record your password in your shell history.
- `ORG` is the org where your app is deployed.
- `SPACE` is the space in the org where your app is deployed.

- Run the following command to map the route to your app:

```
cf map-route MY-APP EXAMPLE.COM --destination-protocol=http2
Creating route MY-APP.EXAMPLE.COM for org my-org / space my-space as admin...
OK
```

Where:

- MY-APP is the name of your app.
- EXAMPLE.COM is the route you want to map to your app.

## Configuring proxy settings for all apps

Some environments restrict access to the Internet by requiring traffic to pass through an HTTP or HTTPS proxy. Operations Manager operators can use the Cloud Foundry Command Line Interface (cf CLI) to provide the proxy settings to all apps, including system apps and service brokers.

Incorrectly configuring proxy settings can prevent apps from connecting to the internet or accessing required resources. It can also cause errands to fail and break system apps, and service brokers. Although errands, system apps, and service brokers do not need to connect to the internet, they often need to access other resources in Operations Manager. Incorrect proxy settings can break these connections.

## Set environment variables

To globally configure proxy settings for Operations Manager apps, you must set three environment variables for both the staging environment variable group and the running environment variable group.

For more information about variable groups, see [Environment Variable Groups](#) in *TAS for VMs Environment Variables*.

The following procedure explains how to set proxy information for both staging and running apps. However, you can also set proxy settings for only staging or only running apps.

To globally configure proxy settings for Operations Manager apps:

- Target your Cloud Controller with the cf CLI. If you have not installed the cf CLI, see [Installing the cf CLI](#). Run:

```
cf api api.SYSTEM-DOMAIN
```

Where SYSTEM-DOMAIN is your system domain.

- Log in with your UAA administrator credentials.
- To retrieve these credentials:
  - Go to the Tanzu Operations Manager Installation Dashboard.
  - Click the VMware Tanzu Application Service for VMs (TAS for VMs) tile.
  - Select the **Credentials** tab.
  - Under **UAA**, next to **Admin Credentials**, click **Link to Credential**.
  - Record the password.
- Run:

```
cf login
```

- To configure proxy access for apps that are staging, run:

```
cf set-staging-environment-variable-group '{"http_proxy": "http://PROXY:8080/", "https_proxy": "http://PROXY:8080/", "no_proxy": "DNS-SUFFIX-OR-IP-ADDRESS,DNS-SUFFIX-OR-IP-ADDRESS"}'
```

Where:

- `http_proxy` is the proxy to use for HTTP requests.
- `https_proxy` is the proxy to use for HTTPS requests. In most cases, this is the same as `http_proxy`.
- `PROXY` is your proxy.
- `no_proxy` is a comma separated list of DNS suffixes or IP addresses that can be accessed without passing through the proxy. VMware recommends this value contains the domain `.cf.internal`, which is used by the platform to communicate with CredHub.
- `DNS-SUFFIX-OR-IP-ADDRESS` is a DNS suffix or IP address that can be accessed without passing through the proxy.

From now on, the proxy settings are applied to apps during staging.

- To configure proxy access for apps that are running:

- Non Java-based apps:

```
cf set-running-environment-variable-group '{"http_proxy": "http://PROXY:8080/", "https_proxy": "http://PROXY:8080/", "no_proxy": "DNS-SUFFIX-OR-IP-ADDRESS,DNS-SUFFIX-OR-IP-ADDRESS"}'
```

Where:

- `http_proxy` is the proxy to use for HTTP requests.
- `https_proxy` is the proxy to use for HTTPS requests. In most cases, this is the same as `http_proxy`.
- `PROXY` is your proxy.
- `no_proxy` is a comma separated list of DNS suffixes or IP addresses that can be accessed without passing through the proxy. VMware recommends this value contains the domain `.cf.internal`, which is used by the platform to communicate with CredHub.
- `DNS-SUFFIX-OR-IP-ADDRESS` is a DNS suffix or IP address that can be accessed without passing through the proxy.

- Java-based apps:

```
cf set-running-environment-variable-group '{"JAVA_OPTS": "-Dhttp.proxyHost=PROXY -Dhttp.proxyPort=8080 -Dhttp.nonProxyHosts=DNS-SUFFIX-OR-IP-ADDRESS|DNS-SUFFIX-OR-IP-ADDRESS"}'
```

Where:

- `-Dhttp.proxyHost` is the proxy to use for HTTP requests.
- `PROXY` is your proxy.
- `-Dhttp.proxyPort` is the port your proxy uses.
- `-Dhttp.nonProxyHosts` is a pipe-separated list of DNS suffixes or IP addresses that can be accessed without passing through the proxy. VMware recommends this value contains the domain `.cf.internal`, which is used by the platform to communicate with CredHub.
- `DNS-SUFFIX-OR-IP-ADDRESS` is a DNS suffix or IP address that can be accessed without passing through the proxy.



#### Note

System environment variables can only be strings. This is enforced on the API. For more information about these Java proxy settings, see [Java Networking and Proxies] (<http://docs.oracle.com/javase/8/docs/technotes/guides/net/proxies.html>).

7. To apply the proxy configuration for the running environment variable group, start each app again for the new configuration.

## Troubleshooting

This section describes solutions to try if an app fails after you apply the global proxy settings.

### Exclude an app from global proxy settings

If your app fails, try instructing the app to ignore the global proxy settings.

To manually unset the proxy environment variables for the failing app:

1. Set the proxy environment variables for `http_proxy` to an empty value by running:

```
cf set-env APP-NAME http_proxy ''
```

Where `APP-NAME` is the name of your app.

2. Set the proxy environment variables for `https_proxy` to an empty value by running:

```
cf set-env APP-NAME https_proxy ''
```

Where `APP-NAME` is the name of your app.

3. Set the proxy environment variables for `no_proxy` to an empty value by running:

```
cf set-env APP-NAME no_proxy ''
```

Where `APP-NAME` is the name of your app.

## Change case of HTTP environment variables

Your app and language runtime might be case-sensitive. Try using the steps in [Set environment variables](#) using uppercase for `HTTP_PROXY`, `HTTPS_PROXY`, and `NO_PROXY` instead of lowercase, as in the following example:

```
cf set-staging-environment-variable-group '{"HTTP_PROXY": "http://PROXY:8080/", "HTTPS_PROXY": "http://PROXY:8080/", "NO_PROXY": "DNS-SUFFIX-OR-IP-ADDRESS,DNS-SUFFIX-OR-IP-ADDRESS"}'.
```

Where:

- `PROXY` is your proxy.
- `DNS-SUFFIX-OR-IP-ADDRESS` is a DNS suffix or IP address that can be accessed without passing through the proxy.

## Check proxy settings

If you have set up your proxy so that it can only send traffic to the Internet, a request to an internal resource like Operations Manager fails. You must set `no_proxy` so that traffic destined for Operations Manager and other internal resources is sent directly and does not go through the proxy. For example, setting `no_proxy` to include your system and app domains will ensure that requests destined for those domains are sent directly.

## Verify interpretation

The interpretation of `no_proxy` depends on the app and the language runtime. Most support `no_proxy`, but the specific implementation can vary. For example, some match DNS names that end with the value set in `no_proxy: example.com` can match `test.example.com`. Others support the use of the asterisk as a wildcard to provide basic pattern matching in DNS names: `*.example.com` can match `test.example.com`. Most apps and language run times do not support pattern matching and wildcards for IP addresses.

## Switching app domains

You can change the domain of an existing Operations Manager installation.

To change the domain of an existing Operations Manager installation:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the VMware Tanzu Application Service for VMs (TAS for VMs) tile.
3. Select **Domains** to see the current **Apps domain** for your TAS for VMs deployment.

## Domains

For help configuring these fields, see the [Configure Domains](#) section of the *Configuring PAS* topic in the PCF documentation.

System domain \*

```
yoursystem.yourdomain.com
```

Apps domain \*

```
yourapps.yourdomain.com
```

**Save**

4. In the terminal, run:

```
cf login -a API-ENDPOINT
```

Where **API-ENDPOINT** is the API endpoint for your TAS for VMs instance.

The cf CLI prompts you for your Operations Manager username and password, and the org and space you want to access. If you do not know your API endpoint, see [Identifying the API Endpoint for Your TAS for VMs Instance](#).

5. To view the domains in the space, run:

```
cf domains
```

The command returns output similar to the following example:

```
$ cf domains
Getting domains in your-org as admin...

name          status
yourapps.yourdomain.com    shared
```

If you have more than one shared domain, ensure that the domain you want to change is at the top of the list before you apply the new domain to your TAS for VMs tile configuration. You can delete and recreate the other shared domains as necessary to push the domain you want to change to the top of the list. If you do this, make sure to map the routes again for each domain.

The status column is named availability. The table refers to private domains with private instead of own. For more information, see [Configuring Routes and Domains](#).

6. To confirm that your apps are assigned to the domain you plan to change, run:

```
cf routes
```

The command returns output similar to the following example:

```
$ cf routes
Getting routes as admin ...

space      host      domain          apps
your-space yourapp yourapps.yourdomain.com yourapp
```

- To create the new domain you want to use, run:

```
cf create-shared-domain NEW-DOMAIN
```

Where `NEW-DOMAIN` is the name you give the new domain.

The command returns output similar to the following example:

```
$ cf create-shared-domain newapps.yourdomain.com

Creating shared domain newapps.yourdomain.com as admin...
OK
```

- To map the new domain to your app, run:

```
cf map-route APP-NAME NEW-DOMAIN -n HOST-NAME
```

Where:

- `APP-NAME` is the name of the app you want to map to the new domain.
- `NEW-DOMAIN` is the domain to which you want to map your app.
- `HOST-NAME` is the hostname of the URL for the route you are mapping.

When you map a TCP route to an app, a random port is assigned to the route by default. To specify a port for a TCP route, use the `-port` flag.

The command returns output similar to the following example:

```
$ cf map-route yourapp newapps.yourdomain.com -n yourapp

Creating route yourapp.newapps.yourdomain.com for org your-org / space
your-space as admin...
OK
Adding route yourapp.newapps.yourdomain.com to app yourapp in org your-
org / space your-space as admin...
OK
```

In this example, both the `APP-NAME` and `HOST-NAME` arguments are `yourapp`, because this is both the name of the app to which you are mapping a route and the intended hostname for the URL.

- Repeat the previous step for each app in this space. Then check Apps Manager to confirm that the route URL has updated correctly for each app.

STATUS	APP	INSTANCES
	myapp <a href="http://myapp.newapps.mydomain...">myapp.newapps.mydomain...</a>	1

10. Repeat the previous steps for each space in your Operations Manager installation except for the System org, beginning with logging into the org and space and ending with confirming the URL update.

Ordinarily the System org contains only Operations Manager apps that perform utility functions for your installation. VMware does not recommend pushing apps to this org. However, if you have pushed apps to the System org, you must also repeat the previous steps for these apps.

11. Once you confirm that every app in every space has been mapped to the new domain, delete the old domain by running:

```
cf delete-shared-domain OLD-DOMAIN
```

Where `OLD-DOMAIN` is the old domain to delete.

The command returns output similar to the following example:

```
$ cf delete-shared-domain yourapps.yourdomain.com
Deleting domain yourapps.yourdomain.com as admin...
```

This domain is shared across all orgs.

Deleting it removes all associated routes, and makes any app with this domain unreachable.

Are you sure you want to delete the domain `yourapps.yourdomain.com`?

When you are prompted, type `yes` to confirm that you want to delete the domain.

12. In the **Domains** pane of the TAS for VMs tile, enter the new domain in the **Apps domain** field. This configures TAS for VMs to use the new domain.

## Domains

For help configuring these fields, see the [Configure Domains](#) section of the *Configuring PAS* topic in the PCF documentation.

System domain \*

yoursystem.yourdomain.com

Apps domain \*

newapps.yourdomain.com

**Save**

13. Return to the Tanzu Operations Manager Installation Dashboard.
14. Click **Review Pending Changes**.
15. Click **Apply Changes**. Any apps you push after this update finishes use this new domain.

## TLS connections in TAS for VMs

Here is a description of the different paths through which external clients, internal components, app containers, and app services communicate in VMware Tanzu Application Service for VMs (TAS for VMs), and how the platform uses Transport Layer Security (TLS) protocols to secure these communications.

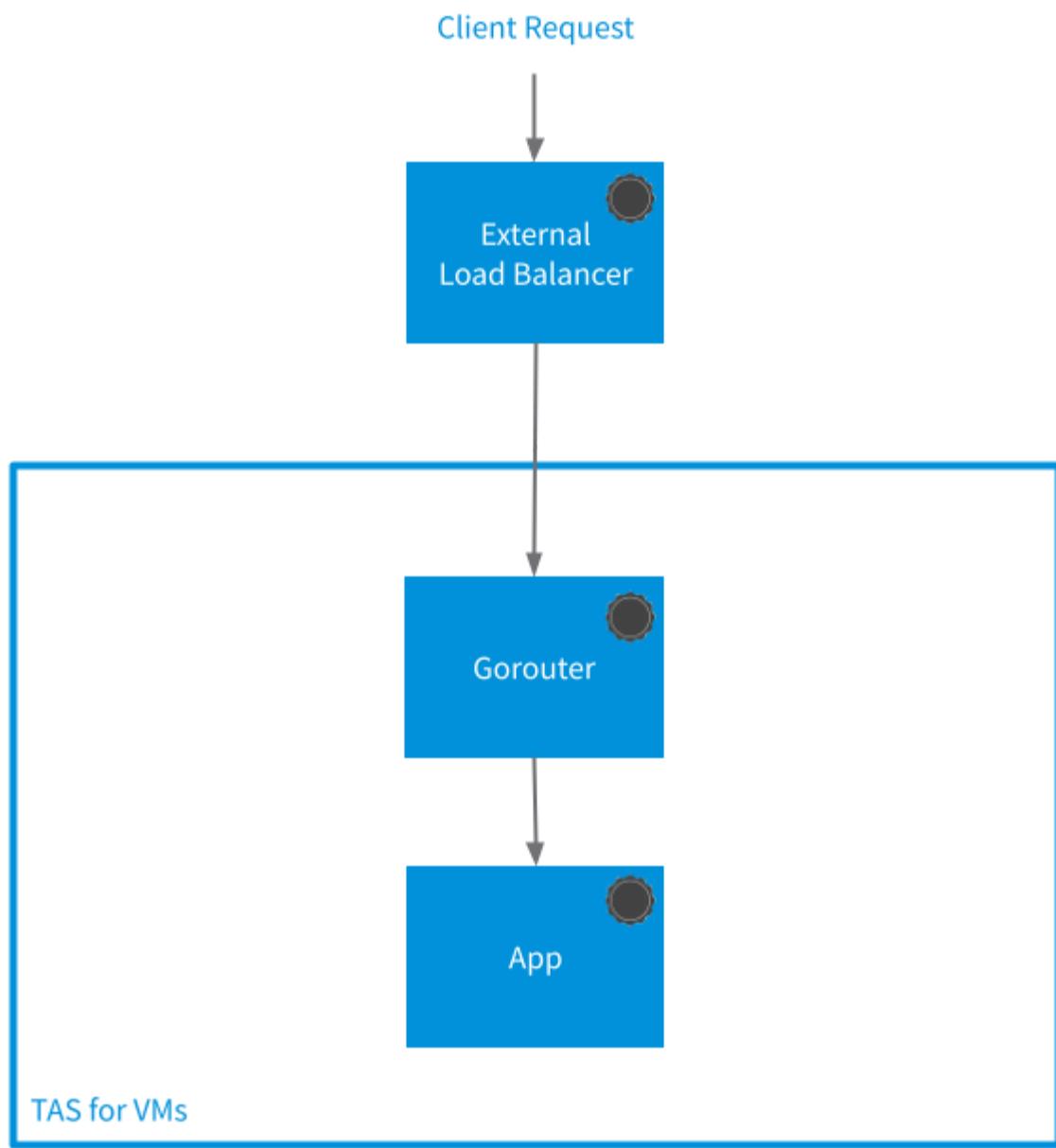
### Types of network communication in TAS for VMs

This section describes the different types of network communication in TAS for VMs and how they are secured with TLS.

Within an TAS for VMs deployment, TLS secures connections between components like the BOSH Director and Service instances. TAS for VMs components also use TLS connections to secure communications with external hardware, such as customer load balancers.

#### Between an external client and an app

The following diagram illustrates the flow of communication from a client making a request to an app. The Client Request goes to the External Load Balancer, and then through Gorouter to the app.



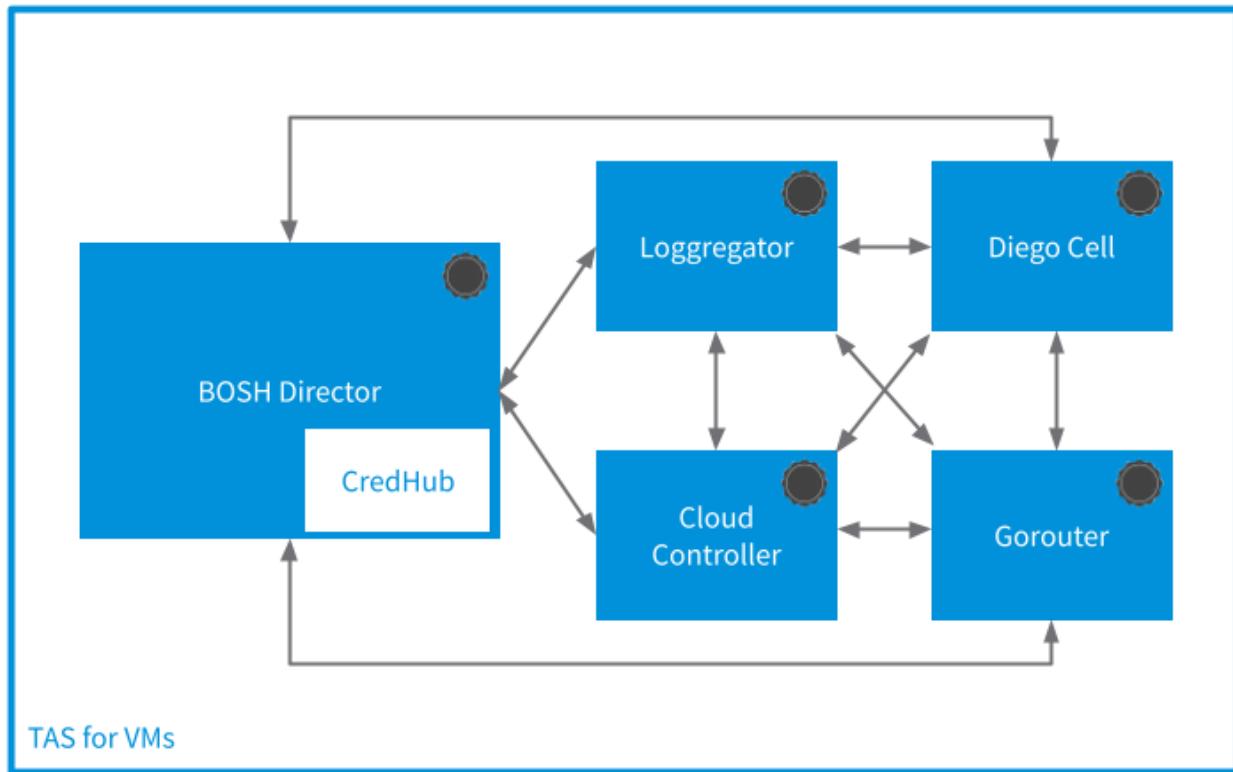
**Certificate**      **TLS Traffic**

The following table describes each component involved in receiving a client request and where their certificates for TLS termination originate:

Component	Certificate Source
External Load Balancer	Enterprise root certificate authority (CA).
Gorouter	Enterprise root CA.
App	Tanzu Operations Manager root CA dedicated to app instance identity. For more information, see <a href="#">App Instance Container Identity Credentials</a> .

## Between platform components

The following diagram illustrates communication between platform components, secured with TLS. The BOSH Director, with CredHub, feeds into Loggregator and Cloud Controller, which also communicate with each other. Loggregator and Cloud Controller feed into Diego Cell and Gorouter, respectively, and all of the components communicate with each other.



The CredHub instance in BOSH generates certificates for all components in Tanzu Operations Manager. The certificates are self-signed by default. To issue certificates signed by your enterprise, you can add a custom CA to CredHub.

Traffic between the Gorouter and Windows stemcells is not encrypted with TLS.

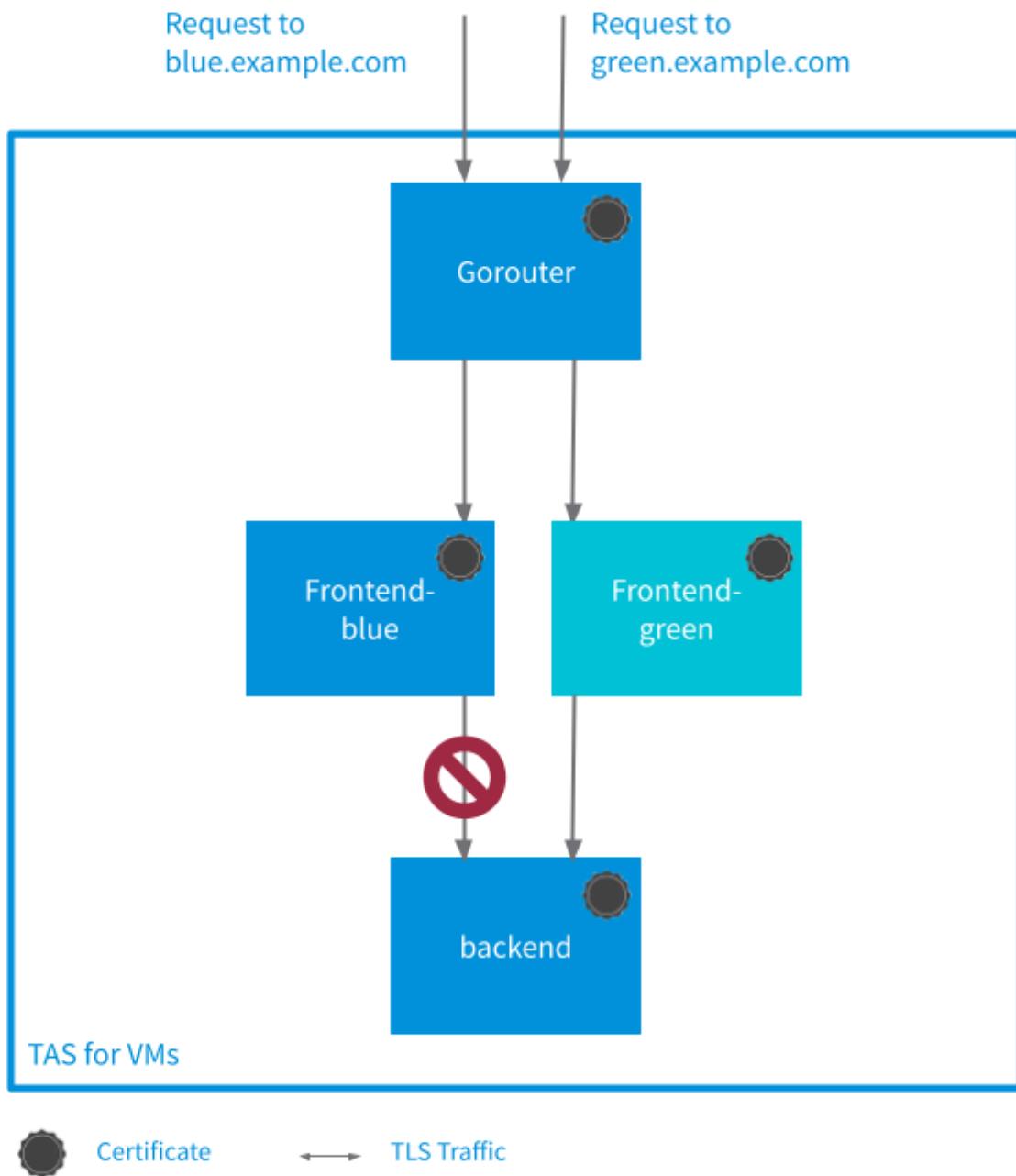
### Component communication details

These topics list the paths, ports, and protocols that subsystems within TAS for VMs use to communicate:

- Cloud Controller Network Communications
- Diego Network Communications
- Loggregator Network Communications
- MySQL Network Communications
- NATS Network Communications
- Routing Network Communications
- UAA Network Communications

## Between apps

The diagram below illustrates TLS communications between apps running on TAS for VMs:



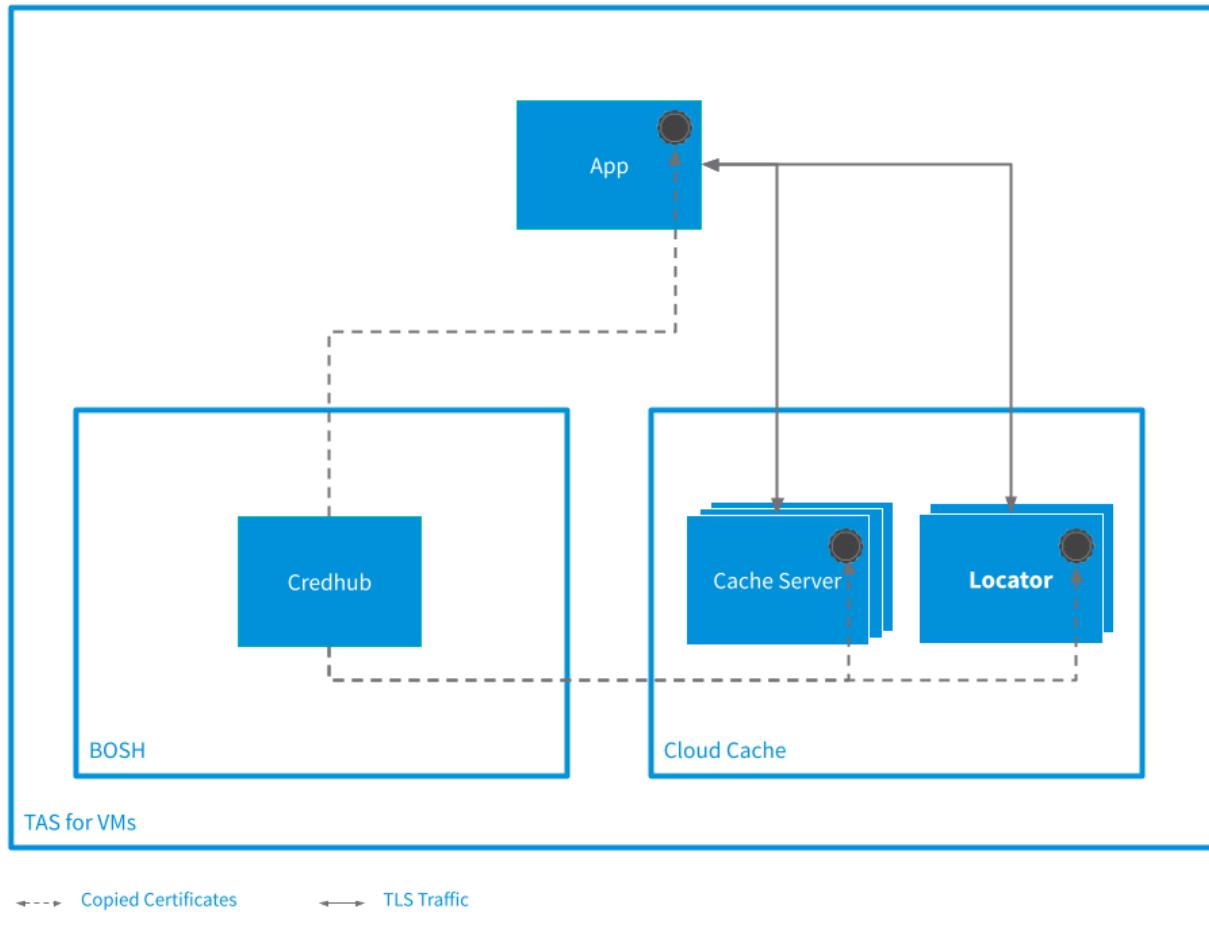
In the example shown, the `frontend-blue` and `frontend-green` apps both receive client requests, but only the `frontend-green` app is allowed to communicate with the `backend` app.

Apps can communicate with each other over TLS using certificates generated by an Tanzu Operations Manager root CA dedicated to app instance identity. For more information, see [App Instance Container Identity Credentials](#).

Developers specify which apps are allowed to communicate using container networking policies. For more information, see [Configuring Container-to-Container Networking](#).

## Between apps and on-platform services

The following diagram illustrates TLS communication between apps and managed, on-platform services. It uses Cloud Cache as an example of a managed service.

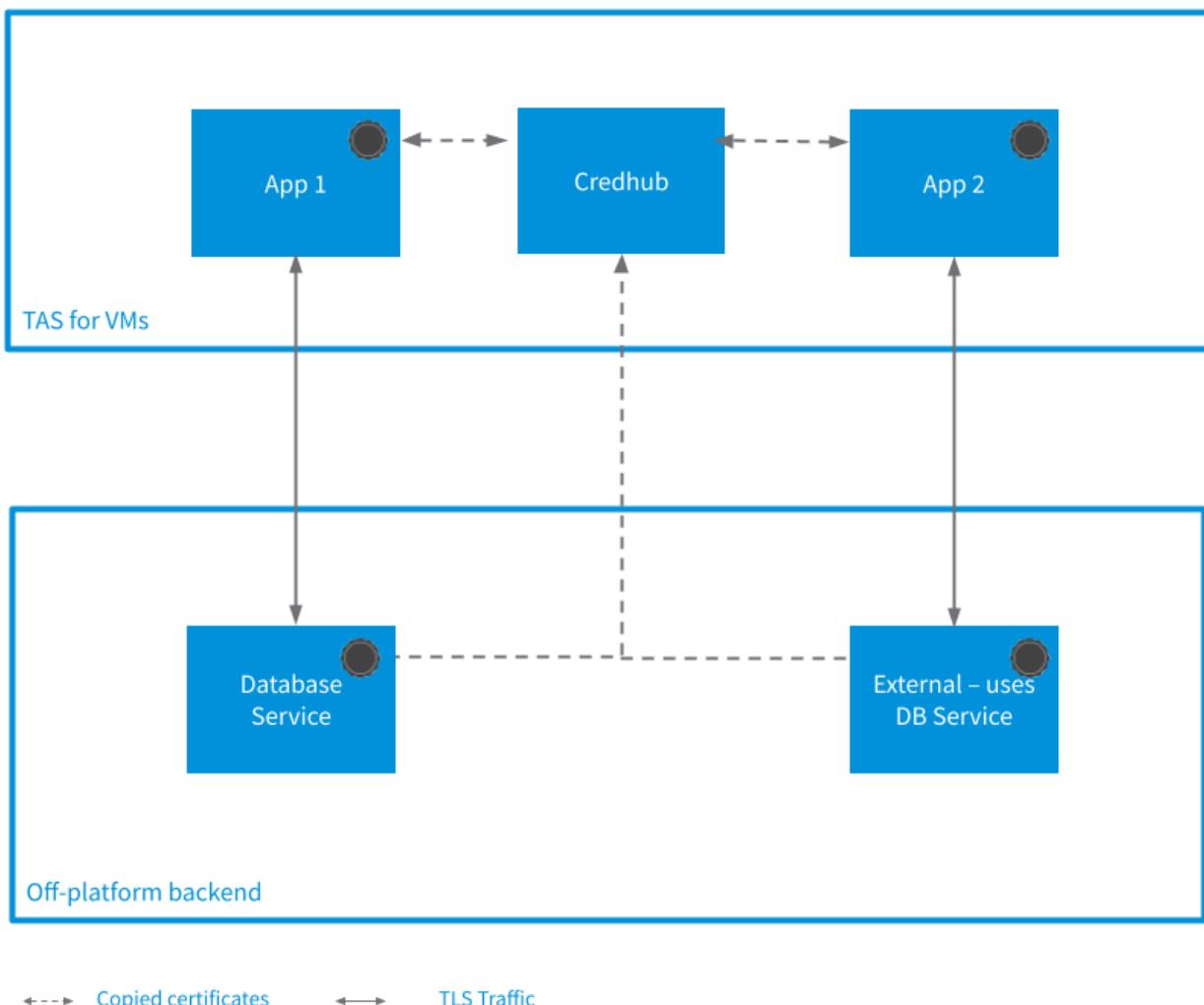


BOSH CredHub issues certificates to the VMware Tanzu GemFire components. For the app, the developer must retrieve a copy of this certificate using the CredHub API and place it in the trust store for the app. For more information, see the [VMware Tanzu GemFire documentation](#).

Separately, TAS for VMs Runtime CredHub might store credentials for the app to access a service over the TLS connection, adding a second layer of security. For more information, see [Securing Services Instance Credentials with Runtime CredHub](#).

## Between apps and external services

The following diagram illustrates communications between apps and external, brokered services secured with TLS:



The developer must retrieve the certificate from the external service and provide it to their app. One way to do this is by placing the certificate in Runtime CredHub and editing your app to consume the certificate through CredHub Service Broker. For more information, see the [CredHub Service Broker](#) documentation.

## App instance container identity credentials

Each app instance container in TAS for VMs has its own identity credentials. This section describes how to process and use these credentials.

### About App instance identity credentials

To learn about app instance identity credentials, see the table below:

Attribute	Description
<b>Purpose</b>	<ul style="list-style-type: none"> <li>For app developers to activate secure TLS communications from their apps.</li> <li>For Tanzu Operations Manager to use internally to validate the identities of app instances.</li> </ul>
<b>Type</b>	<ul style="list-style-type: none"> <li>A PEM-encoded X.509 certificate and PKCS #1 RSA private key.</li> </ul>

<b>Location</b>	<ul style="list-style-type: none"> <li>Tanzu Operations Manager presents the certificate and private key to the app instance through the container filesystem.</li> </ul>
<b>Properties of certificate</b>	<ul style="list-style-type: none"> <li>The <b>Common Name</b> is the app instance GUID.</li> <li>The <b>Subject</b> of the certificate contains an <i>Organizational Unit</i> in the form of <code>app:APP-GUID</code>, where <code>APP-GUID</code> is the app instance GUID.</li> <li>The certificate contains a <b>Subject Alternative Name</b> (SAN) with the IP address for the app instance container.</li> <li>The certificate is valid for 24 hours after being issued.</li> </ul>
<b>Contents of certificate file</b>	<ul style="list-style-type: none"> <li>A chain of PEM-encoded certificates, with the instance-specific certificate first in the list and any intermediates following it.</li> </ul>
<b>Issuing authority</b>	<ul style="list-style-type: none"> <li>Tanzu Operations Manager includes a root CA dedicated to app instance identity. This CA is saved in the system trust store for buildpack-based apps and in a file in <code>/etc/cf-system-certificates</code> in all app instance containers.</li> </ul>

## Using the credentials

If you want to activate secure TLS communications from an app using container instance identity credentials, ensure that you:

- Add the credentials to your development stack configuration:** The credentials must be present in your development stack configuration for your app to use them. You can retrieve the credentials through following environment variables, which Tanzu Operations Manager sets to the locations of key and certificate files.

Credential/Keypair Element	Environment Variable	Command to Retrieve Credential Value
Certificate Chain	<code>CF_INSTANCE_CERT</code>	<code>cf ssh APP-NAME -c 'cat \$CF_INSTANCE_CERT'</code>
Private Key	<code>CF_INSTANCE_KEY</code>	<code>cf ssh APP-NAME -c 'cat \$CF_INSTANCE_KEY'</code>

Where `APP-NAME` is the name of your app.

- Reload the credential files before they expire:** Tanzu Operations Manager rotates the credentials shortly before the current certificate expires. Apps that use these credentials must reload the certificate and key file contents either periodically or in reaction to filesystem watcher events.
- Configure external clients or servers to trust the root CA:** To activate secure TLS communication between an app and a client or server external to Tanzu Operations Manager, you must configure the external client or server to trust the CA that issues app instance container identity credentials. For more information, see the *Issuing Authority* row of the table in [About App Instance Identity Credentials](#).

## Additional information

For more information about instance identity credentials, see [Rotating Instance Identity CA Certificates](#) in the diego-release repository on GitHub.

## TLS cipher suites

By default, Tanzu Operations Manager uses a limited set of cipher suites to secure its internal communications. However, some components used in Tanzu Operations Manager, like the Gorouter, can support additional TLS cipher suites to accommodate older clients outside of Tanzu Operations Manager.

The AWS Classic load balancer does not support the recommended TLS cipher suites. For details and mitigations, see [TLS Cipher Suite Support](#) in *Securing Traffic into TAS for VMs*.

For components that allow you to configure TLS cipher suites, only specify the TLS cipher suites that you need.

## TLS cipher suite recommendations

The default version of TLS is TLS v1.2. VMware recommends using this version.

The TLS cipher suites VMware recommends using within Tanzu Operations Manager are:

- TLS\_DHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256
- TLS\_DHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384
- TLS\_ECDHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256
- TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384

## Gorouter configuration

As part of your TAS for VMs networking configuration, you must specify the TLS cipher suites that the Gorouter uses to secure its communications. Only specify the cipher suites that you need.

The TLS cipher suites VMware recommends for the Gorouter are:

- ECDHE-RSA-AES128-GCM-SHA256
- ECDHE-RSA-AES256-GCM-SHA384

You can specify other cipher suites and a different minimum version of TLS support if your deployment requires it. For a list of other cipher suites and other versions of TLS that are optionally supported by the Gorouter, see [TLS Cipher Suite Support](#) in *Securing Traffic into TAS for VMs*.

For instructions on how to configure the TLS cipher suites for the Gorouter, see [Configure Networking](#).

## Configuring load balancer health checks for TAS for VMs routers

You can configure load balancer health checks for TAS for VMs routers so requests go only to healthy router instances.

In environments that require high availability, you must configure your redundant load balancer to forward traffic directly to the VMware Tanzu Application Service for VMs (TAS for VMs) routers. In environments that do not require high availability, you can skip the load balancer and configure DNS to resolve the TAS for VMs domains directly to a single instance of a router.

## Add health check endpoints for routers

You can configure your load balancer to use either HTTP or HTTPS for checking the health of `gorouter` and `tcp_router` processes.

To disable the HTTP health check endpoints, deselect the **Enable HTTP load balancer health checks** check boxes in the **Networking** pane of the TAS for VMs and Isolation Segment tiles.

## Using HTTPS health check endpoints

To configure your load balancer to use HTTPS health check endpoints, add the IP addresses of all router instances, along with their corresponding port and path:

- Gorouter (HTTP router): `https://GOROUTER_IP:8443/health`
- TCP router: `https://TCP_ROUTER_IP:443/health`

## Using HTTP health check endpoints

To configure your load balancer to use HTTP health check endpoints, add the IP addresses of all router instances, along with their corresponding port and path:

- Gorouter (HTTP router): `http://GOROUTER_IP:8080/health`
- TCP router: `http://TCP_ROUTER_IP:80/health`

## Set the healthy and unhealthy threshold properties for the Gorouter

To maintain high availability during upgrades to the Gorouter, each router is upgraded on a rolling basis. During upgrade of a highly available environment with multiple routers, each router is shut down, upgraded, and restarted before the next router is upgraded. This ensures that any pending HTTP requests passed to the Gorouter are handled correctly.

TAS for VMs uses these properties:

- **Unhealthy threshold:** Specifies the amount of time, in seconds, that the Gorouter continues to accept connections before shutting down. During this period, the health check reports `unhealthy` to cause load balancers to fail over to other Gorouters. Configure a value that is greater than or equal to the maximum amount of time it could take your load balancer to consider a Gorouter instance unhealthy, given repeated failed health checks.
- **Healthy threshold:** Specifies the amount of time, in seconds, to wait until declaring the Gorouter instance started. This allows an external load balancer enough time to register the instance as `healthy`.

You can configure these properties in the **Networking** pane of the TAS for VMs tile. For more information, see [Configure networking in Networking TAS for VMs](#).

The following table describes the behavior of the load balancer health checks when a router shuts down and is restarted.

Step	Description
1	A shutdown request is sent to the router.
2	The router receives shutdown request, which causes the following: <ul style="list-style-type: none"> <li>• The router begins sending Service Unavailable responses to the load balancer health checks.</li> <li>• The load balancer continues sending HTTP request to the router</li> </ul>

Step	Description
3	<p>The load balancer considers the router to be in an unhealthy state, which causes the load balancer to stop sending HTTP requests to the router.</p> <p>The time between step 2 and 3 is defined by the values of the health check interval and threshold configured on the load balancer.</p>
4	<p>The router shuts down.</p> <p>The interval between step 2 and 4 is defined by the Unhealthy Threshold property of the Gorouter. In general, the value of this property should be longer than the value of the interval and threshold values (interval x threshold) of the load balancer. This additional interval ensures that any remaining HTTP requests are handled before the router shuts down.</p>
5	If the router shutdown is initiated by an upgrade, the Gorouter software is upgraded.
6	The router restarts. The router returns Service Unavailable responses for load balancer health checks for 20 seconds; during this time the routing table is preloaded.
7	The routers begins returning Service Available responses to the load balancer health check.
8	The load balancer considers the router to be in a healthy state. The time between step 7 and 8 is specified by the health check interval and threshold configured for your load balancer (health check threshold x health check interval).
9	Shut down and upgrade of the other router begins.

## Configuring Route Service lookup

You can configure route service lookup in VMware Tanzu Application Service for VMs (TAS for VMs).

You can bind your app to a route service to pre process requests before they reach an app. Example use cases include authentication, rate limiting, and caching services. For more information, see [Route Services](#).

The **Bypass security checks for route service lookup** check box in the **Networking** pane of the TAS for VMs tile allows you to configure how the Gorouter handles traffic for apps that are bound to route services. The configuration options are:

- **Default lookup:** Default lookup is configured when you deactivate the **Bypass security checks for route service lookup** check box. In this case, the Gorouter does not check for an existing route. It sends traffic back through the load balancer when the traffic is for an internal route service.
- **Bypass mode:** Bypass mode is configured when you activate the **Bypass security checks for route service lookup** check box. The Gorouter checks for an existing route. If the Gorouter finds the route and the route service is internal, it sends the traffic directly to the route service and skips the load balancer. This improves performance, but introduces the security risk described in [Bypass Mode and External Route Service \(Security Risk\)](#).

## Configure Route Service lookup

These sections provide guidance and configuration steps for route service lookup.

### Guidance

VMware recommends that you do not configure TAS for VMs for bypass mode because of the security risk described in [Bypass Mode and External Route Service \(Security Risk\)](#). However, you might need to do so if

your load balancer requires mutual TLS from clients.

If your load balancer requires mutual TLS from clients and TAS for VMs is configured for default lookup, the Gorouter cannot handle traffic successfully for internal route services. This is because the Gorouter does not have the necessary certificates from the client to communicate back with the load balancer for DNS lookup. Therefore you must configure bypass mode so the Gorouter can send the traffic directly to the route service.

## Configure TAS for VMs for bypass mode

To configure bypass mode:

1. Go to the VMware Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Networking**.
4. In **Route services**, select **Allow**.
5. Activate the **Bypass security checks for route service lookup** check box.
6. Follow the procedure in [Mitigate Security Risk](#).

### Mitigate security risk

To prevent users from intercepting traffic for externally-hosted route services:

1. Create an org for use by the TAS for VMs admin.
2. Register all external route service domains as private domains in the org you created.
3. Monitor TAS for VMs for the addition of new external route services and ensure you follow the same process for those external route services. One way to do this is by using `cf curl` to regularly view a list of user-provided service instances. Run:

```
cf curl /v2/user_provided_service_instances
```

Because route services can be added by any space developer, this might be difficult to manage.

## Configure TAS for VMs for default lookup

To configure TAS for VMs for default lookup behavior, with bypass mode deactivated:

1. Go to the VMware Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Networking**.
4. In **Route services**, select **Allow**.
5. Deselect the **Bypass security checks for route service lookup** check box.
6. Communicate to developers of route services that the domain name for their internally-hosted route services must resolve to the load balancer.
7. If your load balancer or Gorouter terminates TLS:

1. Work with developers of route services to ensure the load balancer or Gorouter have TLS certificates that are valid for the route service URL.
2. Ensure that the TLS certificate from your load balancer is either signed by a well-known Certificate Authority (CA), or the CA has been added to the **Trusted Certificate Authorities** field in the **Networking** pane of the TAS for VMs and Isolation Segment tiles. The CA for the TLS certificate provided by the load balancer must be trusted by the Gorouter.
8. Work with developers of route services to verify that their internal route service apps are reachable. You can do this by visiting the HTTPS URL of the route service directly and confirming that the app received the request with the `cf logs` output for the route service app.

## Summary of behavior in different configurations

These sections describe how the Gorouter behaves when bypass mode is activated or deactivated and when a route service is internal or external.

### Default lookup and internal route service

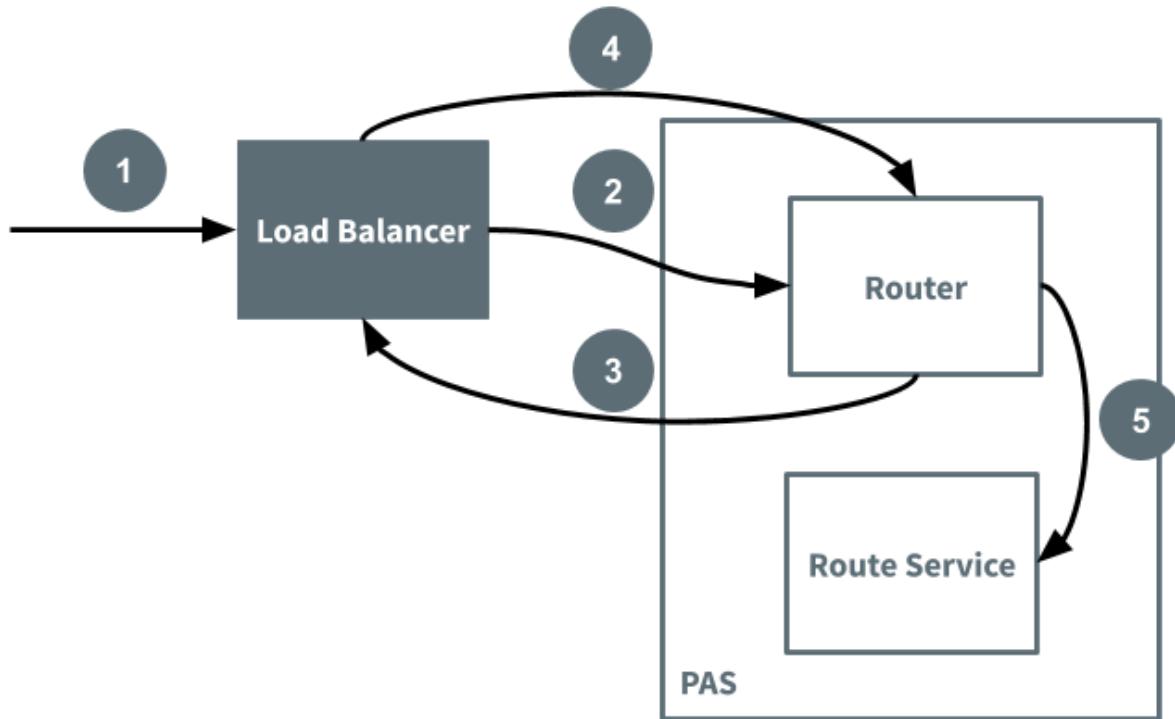
This section describes how the Gorouter handles app requests when:

- The **Bypass security checks for route service lookup** check box in TAS for VMs is deselected.
- The app is bound to a route service that is hosted on TAS for VMs.

In this case, when the Gorouter receives the request, it sends the traffic back to the load balancer to resolve DNS. The load balancer then sends the traffic back to the Gorouter.

A request makes multiple trips between the load balancer and Gorouter before reaching the route service. Four boxes are labeled as follows: Load Balancer, Gorouter, Route Service, and TAS for VMs. The Gorouter and route service box are inside of the TAS for VMs box to show that they are running inside of TAS for VMs. Arrows numbered 1-5 indicate the flow of the request in the following order: load balancer, Gorouter, load balancer, Gorouter, Gorouter service.

The diagram below illustrates the flow of the request and numbers the steps to indicate order of occurrence.



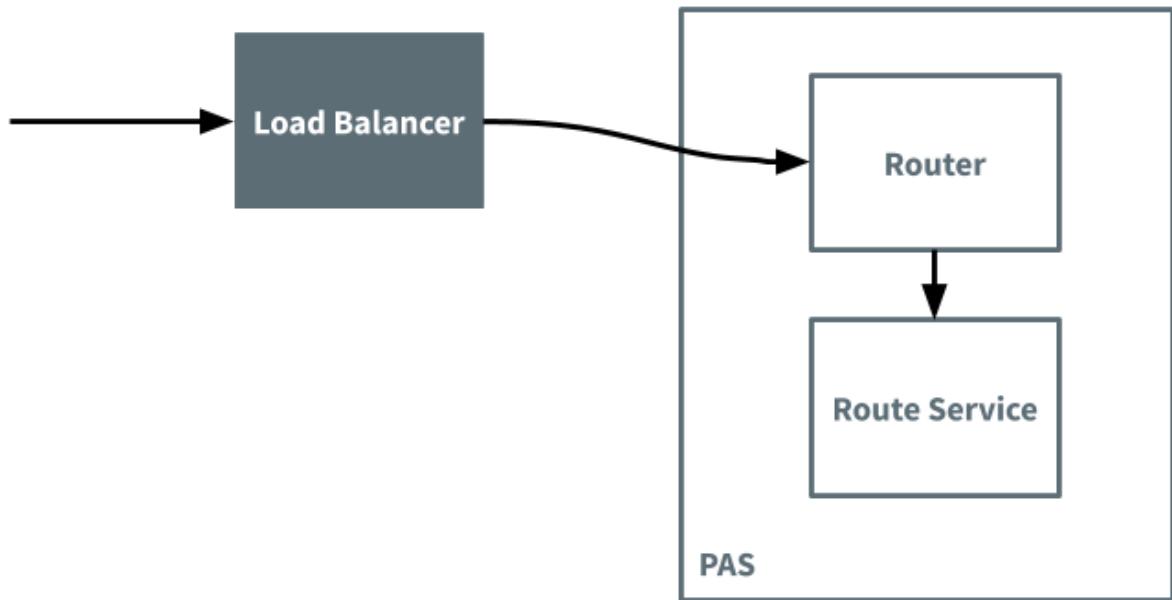
## Bypass mode and internal route service

This section describes how the Gorouter handles app requests when:

- The **Bypass security checks for route service lookup** check box in TAS for VMs is selected.
- The app is bound to a route service that is hosted on TAS for VMs.

In this case, when the Gorouter receives the request, it sends it directly to the route service. This assumes the Gorouter finds an existing route for the route service.

The diagram below illustrates the flow of the request. Arrows indicate the flow of the request through platform components. A request goes directly from the load balancer to the Gorouter to the route service.



## Bypass mode and external route service (security risk)

This section describes how the Gorouter handles app requests when:

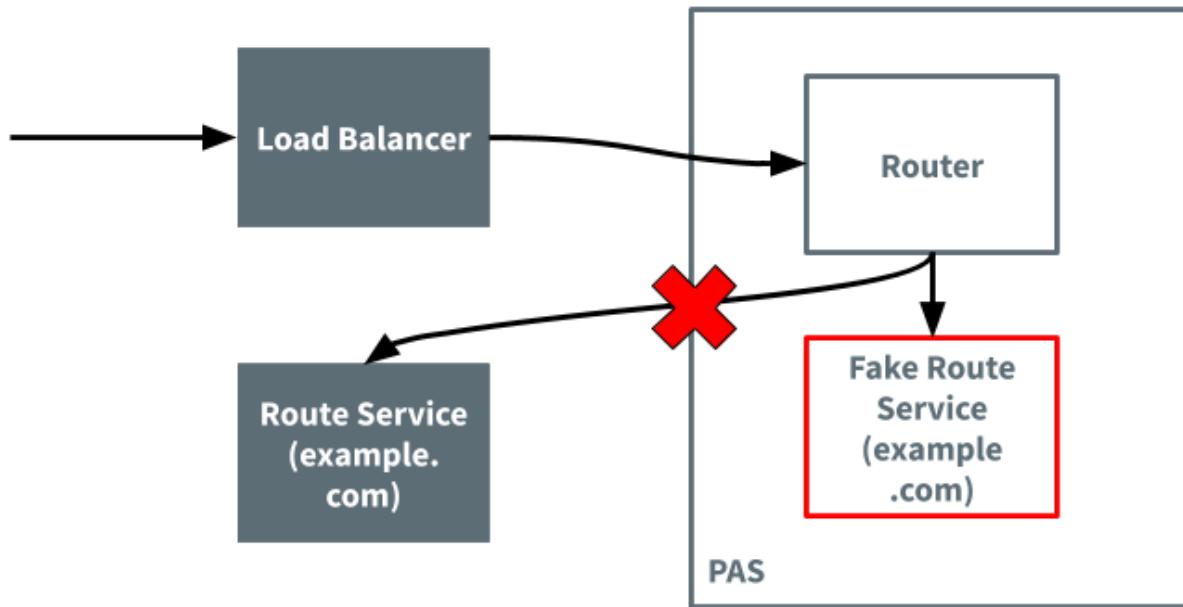
- The **Bypass security checks for route service lookup** check box in TAS for VMs is selected.
- The app is bound to a route service that is hosted outside of TAS for VMs.

In this case, when the Gorouter receives the request, it checks for an existing route and then sends the request directly to the route service. This activates external clients to intercept route service traffic. A developer can register the external route service domain as a private domain in TAS for VMs and map it to their own, malicious app. When the Gorouter receives a request for the original app bound to the external route service, it finds the domain internally and sends the request to the malicious app.

This vulnerability exists for both externally hosted route services and route services hosted on a separate foundation. If all of your route services are hosted internally on the same foundation, you are not at risk. However, you might be at risk if externally hosted route services are later configured.

A fake route service inside of TAS for VMs intercepts traffic intended for a route service outside of TAS for VMs. Five boxes are labeled as follows: Load Balancer, Gorouter, Route Service (example.com), Fake Route Service (example.com), and TAS for VMs. The Gorouter and fake route service boxes are inside of the TAS for VMs box to show that they are running inside of TAS for VMs. The arrows point to the load balancer and then the Gorouter to indicate the flow of traffic. The two arrows then point from the Gorouter: one to the fake route service and another to the route service. A red "X" indicates that the traffic does not go to the route service. It instead goes to the fake route service.

The following diagram illustrates the flow of the request in the case that it is intercepted.



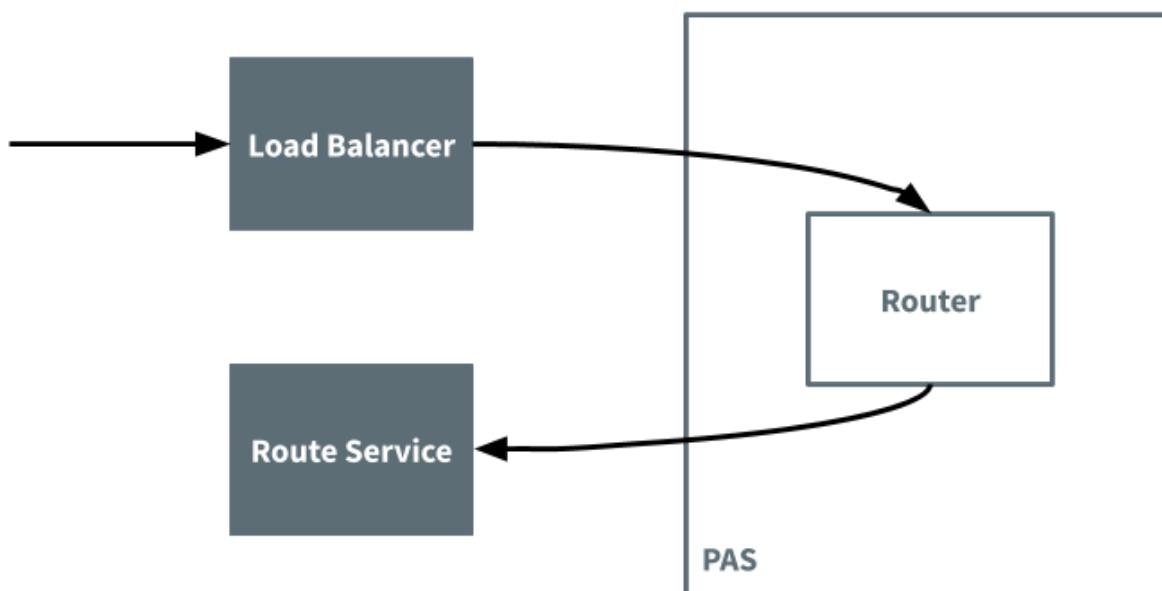
## Default lookup and external route service

This section describes how the Gorouter handles app requests when:

- The **Bypass security checks for route service lookup** check box in TAS for VMs is deselected.
- The app is bound to a route service that is hosted outside of TAS for VMs.

In this case, the Gorouter sends traffic directly to the external route service without checking for an existing route.

The following diagram illustrates the flow of the request. The arrows indicate the flow of the request through platform components. A request goes directly from the load balancer to the Gorouter to the route service.



# Configuring delayed job priorities with Cloud Controller

You can change the priority of delayed jobs with the Cloud Controller in VMware Tanzu Application Service for VMs (TAS for VMs).

## Cloud Controller and job priority

VMware Tanzu Application Service for VMs (TAS for VMs) creates delayed jobs as it performs certain asynchronous actions, such as `DELETE v3/buildbacks/[GUID]`. These jobs are processed asynchronously by multiple worker processes.

By default, all jobs have the same priority of `0`. Job priorities of higher numerical values are lower than job priorities of lower numerical values. Conversely, job priorities of negative numerical values are higher than job priorities of positive numerical values. For example, the Cloud Controller schedules a job with a priority of `-1` before a job with a priority of `0`, and schedules a job with a priority of `1` before a job with a priority of `0`.

When a job fails, the Cloud Controller might reschedule the job and give it a lower priority, depending on how the job is configured. When the Cloud Controller reschedules a failed job and gives it a lower priority, it doubles the priority each time the job fails: first from `0` to `1`, then to `2`, then `4`, then `8`, and so on. Each time a job receives a lower priority, the time until the Cloud Controller schedules its next run increases accordingly. In the logs for some Cloud Controller components, this scheduled time appears in the `run_at` column of the `delayed_jobs` table.

When a job with a priority of negative numerical value fails multiple times, the Cloud Controller lowers its priority to `0`, then doubles its priority afterward.

## Delayed jobs

In the logs for some Cloud Controller components, you can view a jobs that have been delayed in the `delayed_jobs` table.

The following list contains the `display_name` of each job in the `delayed_jobs` table that you can configure with a different default priority:

- `service_binding.delete`
- `organization.delete`
- `space.delete`
- `service_instance.delete`
- `service_key.delete`
- `service_key.delete`
- `service_key.delete`
- `app_model.delete`
- `buildpack.delete`
- `domain.delete`
- `droplet_model.delete`

- droplet\_model.delete
- quota\_definition.delete
- packages\_model.delete
- role.delete
- route.delete
- security\_group.delete
- service\_broker.delete
- space\_quota\_definition.delete
- user.delete
- space.apply\_manifest
- admin.clear\_buildpack\_cache
- service\_instance.create
- service\_bindings.create
- buildpack.upload
- space.delete\_unmapped\_routes
- service\_keys.delete
- service\_instance.update
- service\_route\_bindings.create
- service\_route\_bindings.delete
- service\_keys.create
- droplet.upload
- service\_bindings.delete
- service\_broker.catalog.synchronize
- service\_broker.update

## Overriding the default priority of a job

You can override the default priority for the jobs listed in [Delayed Jobs](#) above by creating an operations file in YAML format that contains a list of job names and their new priorities.

The following example shows an operations file that gives the `space.apply_manifest` job the highest priority and configures the `cloud_controller_ng` job to run it before any other job:

```
- type: replace
  path: /instance_groups/name=api/jobs/name=cloud_controller_ng/properties/cc/jobs?/priorities?
  value:
    space.apply_manifest: -10
```

For more information about operations files, see the [BOSH documentation](#).

## Internal app security

In this section:

- [Container security](#)
- [Container-to-container networking](#)
- [App security groups](#)
- [Restricting app access to internal TAS for VMs components](#)

## Container security

This topic tells you about how VMware Tanzu Application Service for VMs (TAS for VMs) secures the containers that host app instances on Linux.

For an overview of other TAS for VMs security features, see [TAS for VMs Security](#).

The sections in this topic provide the following information:

- [Container Mechanics](#) provides an overview of container isolation.
- [Inbound and Outbound Traffic from TAS for VMs](#) provides an overview of container networking and describes how TAS for VMs admins customize container network traffic rules for their deployment.
- [Container Security](#) describes how TAS for VMs secures containers by running app instances in unprivileged containers and by hardening them.

## Container mechanics

Each instance of an app deployed to TAS for VMs runs within its own self-contained environment, a Garden container. This container isolates processes, memory, and the filesystem using operating system features and the characteristics of the virtual and physical infrastructure where TAS for VMs is deployed. For more information about Garden containers, see [Garden](#).

TAS for VMs achieves container isolation by namespacing kernel resources that would otherwise be shared. The intended level of isolation is set to prevent multiple containers that are present on the same host from detecting each other. Every container includes a private root filesystem, which includes a Process ID (PID), namespace, network namespace, and mount namespace.

TAS for VMs creates container filesystems using the Garden Rootfs (GrootFS) tool. It stacks the following using OverlayFS:

- **A read-only base filesystem:** This filesystem has the minimal set of operating system packages and Garden-specific modifications common to all containers. Containers can share the same read-only base filesystem because all writes are applied to the read-write layer.
- **A container-specific read-write layer:** This layer is unique to each container and its size is limited by XFS project quotas. The quotas prevent the read-write layer from overflowing into unallocated space.

For more information about GrootFS, see [Garden RootFS \(GrootFS\)](#) in [Garden](#).

Resource control is managed using Linux control groups. Associating each container with its own cgroup or job object limits the amount of memory that the container might use. Linux cgroups also require the container to use a fair share of CPU compared to the relative CPU share of other containers.

TAS for VMs does not support a RedHat Enterprise Linux OS stemcell. This is due to an inherent security issue with the way RedHat handles user namespaces and container isolation.

## CPU

Each container is placed in its own cgroup. Cgroups make each container use a fair share of CPU relative to the other containers. This prevents oversubscription on the host VM where one or more containers hog the CPU and leave no computing resources to the others.

The way cgroups allocate CPU time is based on shares. CPU shares do not work as direct percentages of total CPU usage. Instead, a share is relative in a given time window to the shares held by the other containers. The total amount of CPU that can be overall divided among the cgroups is what is left by other processes that might run in the host VM.

Generally, cgroups offers two possibilities for limiting the CPU usage: *CPU affinity* and *CPU bandwidth*, the latter of which is used in TAS for VMs.

- CPU affinity consists of binding a cgroup to certain CPU cores. The actual amount of CPU cycles that can be consumed by the cgroup is thus limited to what is available on the bound CPU cores.
- CPU bandwidth sets the weight of a cgroup with the process scheduler. The process scheduler divides the available CPU cycles among cgroups depending on the shares held by each cgroup, relative to the shares held by the others. For example, consider two cgroups, one holding two shares and one holding four. Assuming the process scheduler gets to administer 60 CPU cycles, the first cgroup with two shares will get one third of those available CPU cycles, as it holds one third of the overall shares. Similarly, the second cgroup will get 40 cycles, as it holds two thirds of the collective shares.

The calculation of the CPU usage based on the percentage of the total CPU power available is quite sophisticated and is performed regularly as the CPU demands of the various containers fluctuates.

Specifically, the percentage of CPU cycles a cgroup gets can be calculated by dividing the `cpu.shares` it holds by the sum of the `cpu.shares` of all the cgroups that are currently doing CPU activity, as shown in the following calculation:

```
process_cpu_share_percent = cpu.shares / sum_cpu_shares * 100
```

The actual number of shares a cgroup gets can be read from the `cpu.shares` file of the cgroup configurations pseudo-file-system available in the container at `/sys/fs/cgroup/cpu`. The number of shares given to an apps cgroup depends on the amount of memory the app declares to need in the manifest. TAS for VMs scales the number of allocated shares linearly with the amount of memory.

The following algorithm is used to determine the number of CPU shares for an app:

```
process_cpu.shares = app_memory_in_mb + 32
```

The next example helps to illustrate this better. Consider three processes: P1, P2 and P3, which are assigned `cpu.shares` of 5, 20 and 30, respectively.

P1 is active, while P2 and P3 require no CPU. Hence, P1 might use the whole CPU. When P2 joins in and is doing some actual work, such as when a request comes in, the CPU share between P1 and P2 is calculated as follows:

- P1  $\rightarrow 5 / (5+20) = 0.2 = 20\%$
- P2  $\rightarrow 20 / (5+20) = 0.8 = 80\%$
- P3 (idle)

At some point, process P3 joins in. Then the distribution is recalculated again:

- P1  $\rightarrow 5 / (5+20+30) = 0.0909 = \sim 9\%$
- P2  $\rightarrow 20 / (5+20+30) = 0.363 = \sim 36\%$
- P3  $\rightarrow 30 / (5+20+30) = 0.545 = \sim 55\%$

If P1 becomes idle, the following recalculation between P2 and P3 takes place:

- P1 (idle)
- P2  $\rightarrow 20 / (20+30) = 0.4 = 40\%$
- P3  $\rightarrow 30 / (20+30) = 0.6 = 60\%$

If P3 finishes or becomes idle, then P2 can consume all the CPU, as another recalculation is performed.

In summary, the cgroup shares are the minimum guaranteed CPU share that the process can get. This limitation becomes effective only when processes on the same host compete for resources.

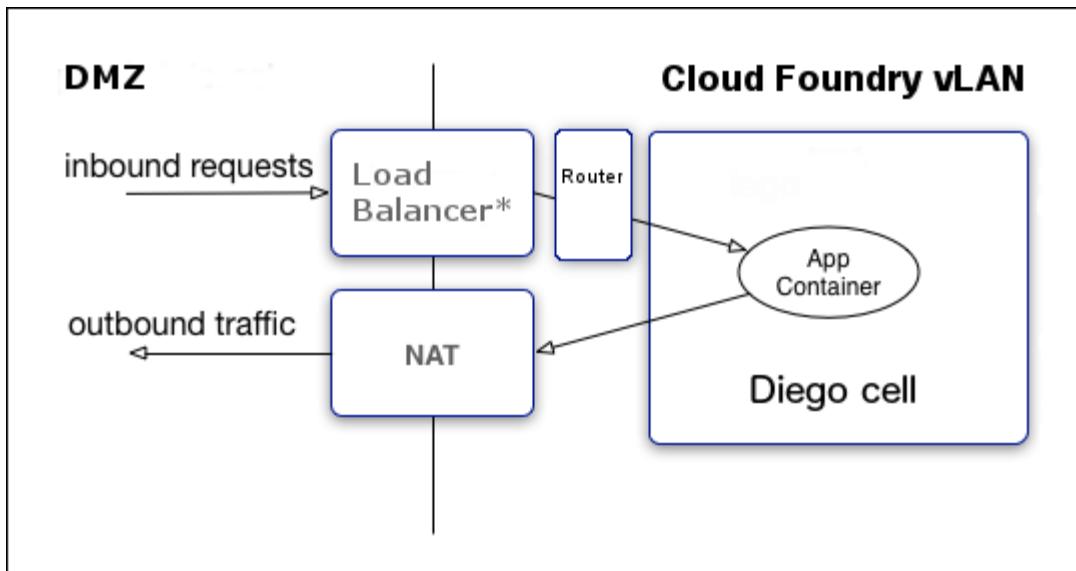
## Inbound and outbound traffic from TAS for VMs

Learn about container networking and how TAS for VMs admins customize container network traffic rules for their deployment.

### Networking overview

A host VM has a single IP address. If you configure the deployment with the cluster on a VLAN, as VMware recommends, then all traffic goes through the following levels of network address translation, as shown in the following diagram:

- **Inbound** requests flow from the load balancer through the router to the host Diego Cell, then into the app container. The router determines which app instance receives each request.
- **Outbound** traffic flows from the app container to the Diego Cell, then to the gateway on the Diego Cell's virtual network interface. Depending on your IaaS, this gateway might be a NAT to external networks.



The networking diagram shows the following:

- Inbound requests go to Load Balancer
- Outbound traffic comes from NAT

Cloud Foundry vLAN (on right side):

- Load balancer goes to router and to the app container inside the Diego Cell
- App container response goes to NAT

## Network traffic rules

Admins configure rules to govern container network traffic. This is how containers send traffic outside of TAS for VMs and receive traffic from outside, the Internet. These rules can prevent system access from external networks and between internal components and determine if apps can establish connections over the virtual network interface.

Admins configure these rules at two levels:

- Application Security Groups (ASGs) apply network traffic rules at the container level. For information about creating and configuring ASGs, see [App Security Groups](#).
- Container-to-container networking policies determine app-to-app communication. Within TAS for VMs, apps can communicate directly with each other, but the containers are isolated from outside TAS for VMs. For information about configuring container-to-container network policies, see [Configuring Container-to-Container Networking](#).

## Container security

TAS for VMs secures containers through the following measures:

- Running app instances in unprivileged containers by default. For more information about app instances, see [Types](#).
- Hardening containers by limiting function and access rights. For more information about hardening containers, see [Hardening](#).

- Allowing admins to configure ASGs to block outbound connections from app containers. For information about creating and configuring ASGs, see [App Security Groups](#).

## Types

Garden has the following container types:

- unprivileged
- privileged

Currently, TAS for VMs runs all app instances and staging tasks in unprivileged containers by default. This measure increases security by eliminating the threat of root escalation inside the container.

## Hardening

TAS for VMs mitigates against container breakout and denial of service attacks in the following ways:

- TAS for VMs uses the full set of Linux namespaces - IPC, Network, Mount, PID, User, UTS - to provide isolation between containers running on the same host. The User namespace is not used for privileged containers. For more information about Linux namespaces, see [namespaces - overview of Linux namespaces](#) in the Ubuntu documentation.
- In unprivileged containers, Operations Manager maps UID/GID 0 (root) inside the container user namespace to a different UID/GID on the host to prevent an app from inheriting UID/GID 0 on the host if it breaks out of the container.
  - TAS for VMs uses the same UID/GID for all containers.
  - TAS for VMs maps all UIDs except UID 0 to themselves. TAS for VMs maps UID 0 inside the container namespace to `MAX_UID-1` outside of the container namespace.
  - Container Root does not grant Host Root permissions.
- TAS for VMs mounts `/proc` and `/sys` as read-only inside containers.
- TAS for VMs disallows `dmesg` access for unprivileged users and all users in unprivileged containers.
- TAS for VMs uses `chroot` when importing docker images from docker registries.
- TAS for VMs establishes a container-specific overlay filesystem mount. TAS for VMs uses `pivot_root` to move the root filesystem into this overlay, in order to isolate the container from the host system's filesystem. For more information about `pivot_root`, see [pivot\\_root - change the root filesystem](#) in the Ubuntu documentation.
- TAS for VMs does not call any binary or script inside the container filesystem, in order to eliminate any dependencies on scripts and binaries inside the root filesystem.
- TAS for VMs avoids side-loading binaries in the container through bind mounts or other methods. Instead, it runs the same binary again by reading it from `/proc/self/exe` whenever it needs to run a binary in a container.
- TAS for VMs establishes a virtual ethernet pair for each container for network traffic. For more information, see [Container Network Traffic](#). The virtual ethernet pair has the following features:

- One interface in the pair is inside the container’s network namespace, and is the only non-loopback interface accessible inside the container.
  - The other interface remains in the host network namespace and is bridged to the container-side interface.
  - Egress allow list rules are applied to these interfaces according to ASGs configured by the admin.
  - First-packet logging rules might also be activated on the TCP allow list rules.
  - DNAT rules are established on the host to enable traffic ingress from the host interface to allowed ports on the container-side interface.
- TAS for VMs applies disk quotas using container-specific XFS quotas with the specified disk-quota capacity.
  - TAS for VMs applies a total memory usage quota through the memory cgroup and destroys the container if the memory usage exceeds the quota.
  - TAS for VMs applies a fair-use limit to CPU usage for processes inside the container through the `cpu.shares` control group.
  - TAS for VMs allows admins to rate limit the maximum bandwidth consumed by single-app containers, configuring `rate` and `burst` properties on the `silk-cni` job.
  - TAS for VMs limits access to devices using cgroups but explicitly allows the following safe device nodes:
    - `/dev/full`
    - `/dev/fuse`
    - `/dev/null`
    - `/dev/ptmx`
    - `/dev/pts/*`
    - `/dev/random`
    - `/dev/tty`
    - `/dev/tty0`
    - `/dev/tty1`
    - `/dev/urandom`
    - `/dev/zero`
    - `/dev/tap`
    - `/dev/tun`
  - TAS for VMs drops the following Linux capabilities for all container processes. Every dropped capability limits the actions the root user can perform.
    - `CAP_DAC_READ_SEARCH`
    - `CAP_LINUX_IMMUTABLE`

- `CAP_NET_BROADCAST`
- `CAP_NET_ADMIN`
- `CAP_IPC_LOCK`
- `CAP_IPC_OWNER`
- `CAP_SYS_MODULE`
- `CAP_SYS_RAWIO`
- `CAP_SYS_PTRACE`
- `CAP_SYS_PACCT`
- `CAP_SYS_BOOT`
- `CAP_SYS_NICE`
- `CAP_SYS_RESOURCE`
- `CAP_SYS_TIME`
- `CAP_SYS_TTY_CONFIG`
- `CAPLEASE`
- `CAP_AUDIT_CONTROL`
- `CAP_MAC_OVERRIDE`
- `CAP_MAC_ADMIN`
- `CAP_SYSLOG`
- `CAP_WAKE_ALARM`
- `CAP_BLOCK_SUSPEND`
- `CAP_SYS_ADMIN` for unprivileged containers

For more information about Linux capabilities, see [capabilities - overview of Linux capabilities](#) in the Ubuntu documentation.

## Container-to-container networking

This topic provides you with an overview of how container-to-container networking works in VMware Tanzu Application Service for VMs (TAS for VMs).

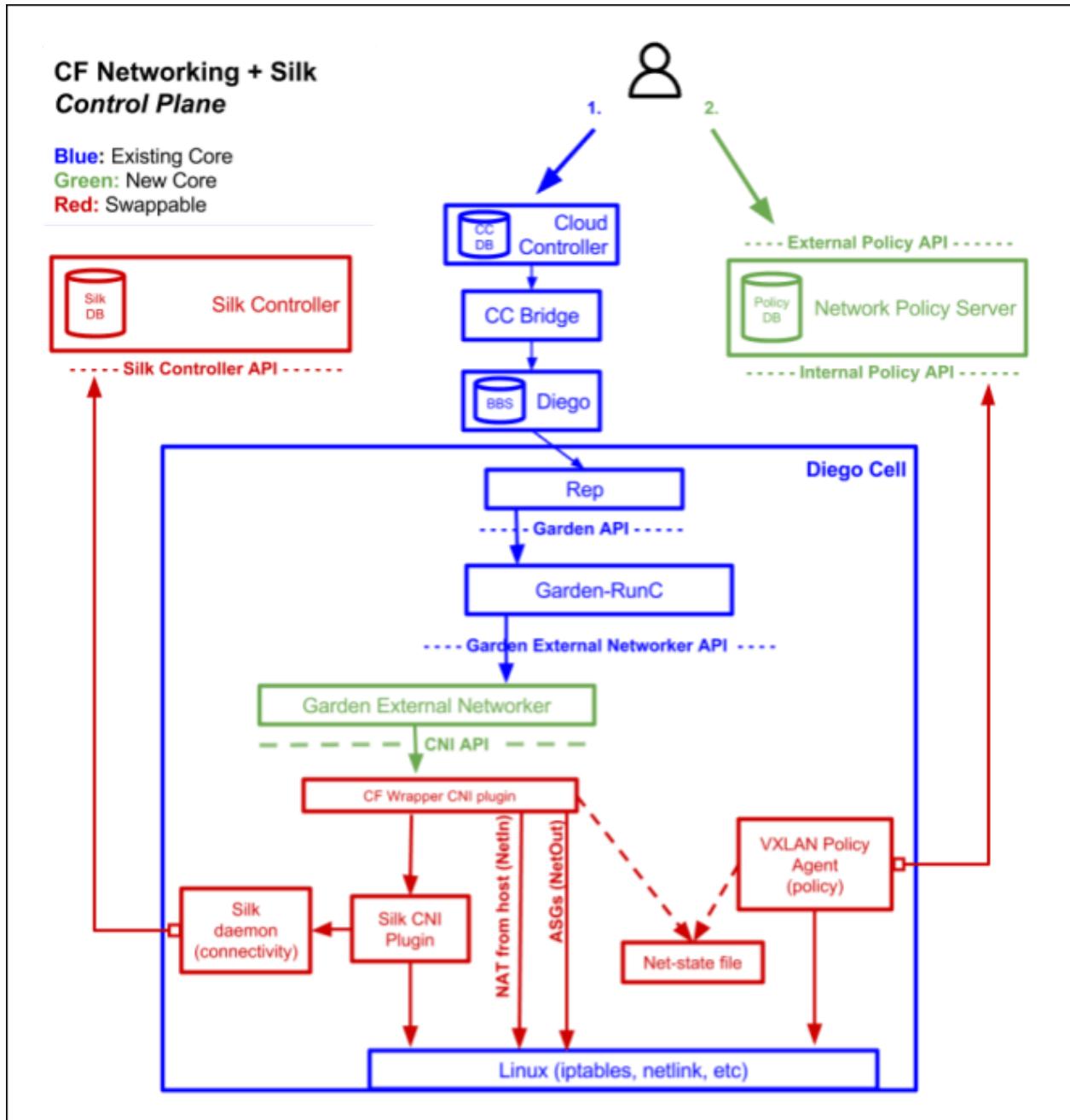
Container-to-container networking is not available for apps hosted on Microsoft Windows.

The container-to-container networking feature enables app instances to communicate with each other directly. Container-to-container networking is always enabled in TAS for VMs. For more information about how to configure container-to-container networking, see [Configuring Container-to-Container Networking](#).

## Architecture

Container-to-container networking integrates with [Garden-runC] in a Diego deployment. The CF Networking Release includes several core components, as well as swappable components. For more information about Garden-runC, see [Garden-runC in Garden](#). For more information about Diego, see [Diego Components and Architecture](#). For more information about the CF Networking release, see [CF Networking Release](#) on GitHub.

To understand the components and how they work, see the following diagram and tables. The diagram highlights TAS for VMs components in blue and green. The diagram also highlights swappable components in red.



## Core components

The container-to-container networking BOSH release has the following core components:

Part	Function
Policy Server	A central management node that: <ul style="list-style-type: none"> <li>Maintains a database of policies for traffic between apps. The cf CLI calls an API to create or update a record in the policy database whenever you create or remove a policy.</li> <li>Exposes a JSON REST API used by the cf CLI. This API serves traffic using TLS.</li> </ul>
Garden External Networker	A Garden-runC add-on deployed to every Diego Cell that: <ul style="list-style-type: none"> <li>Runs the CNI plug-in component to set up the network for each app.</li> <li>Forwards ports to support incoming connections from the Gorouter, TCP Router, and Diego SSH Proxy. This keeps apps externally reachable.</li> <li>Installs outbound allow list rules to support Application Security Groups (ASGs).</li> </ul>

## Swappable components

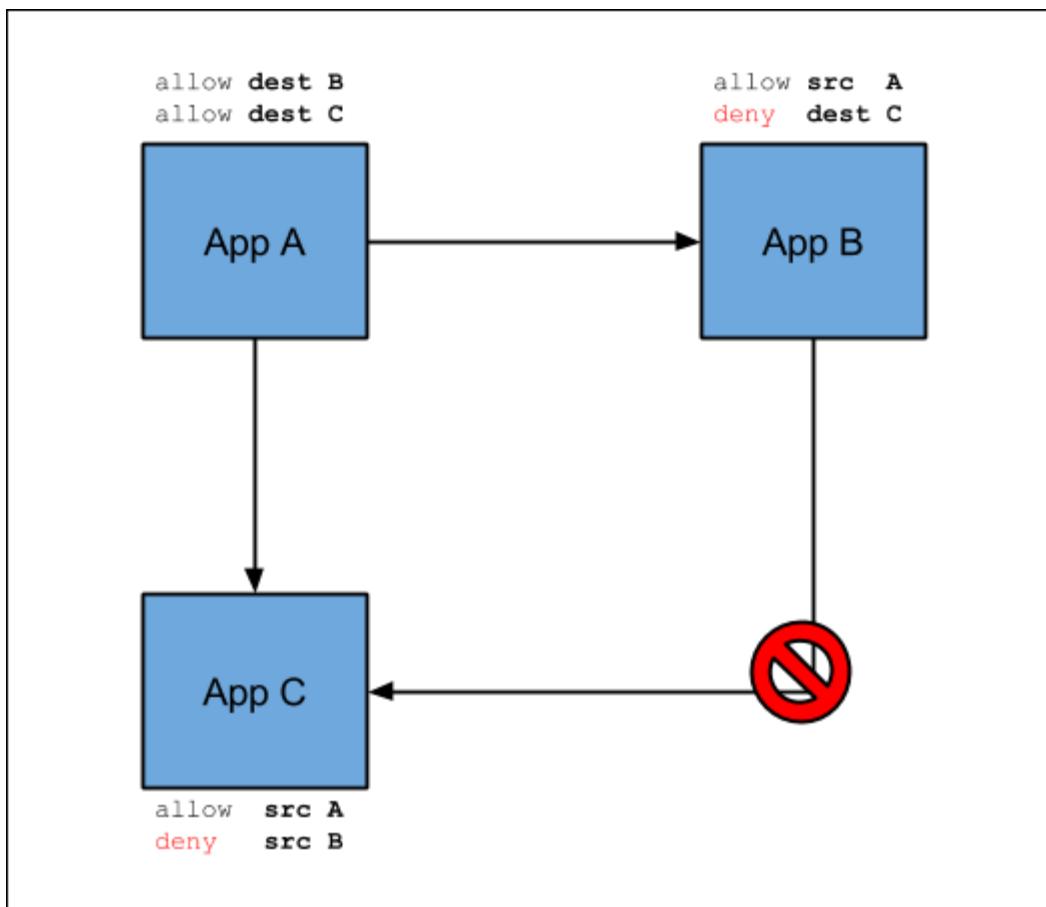
Part	Function
Silk CNI plug-in	A plug-in that provides IP address management and network connectivity to app instances as follows: <ul style="list-style-type: none"> <li>Uses a shared VXLAN overlay network to assign each container a unique IP address.</li> <li>Installs network interface in container using the Silk VXLAN back end. This is a shared, flat L3 network.</li> </ul>
VXLAN Policy Agent	Enforces network policy for traffic between apps as follows: <ul style="list-style-type: none"> <li>Discovers network policies from the Policy Server Internal API.</li> <li>Updates iptables rules on the Diego Cell to allow approved inbound traffic.</li> <li>Tags outbound traffic with the unique identifier of the source app using the VXLAN Group-Based Policy (GBP) header.</li> </ul>

## App instance communication

The following diagram illustrates how app instances communicate in a deployment with container-to-container networking enabled. In this example, the operator creates two policies to regulate the flow of traffic between **App A**, **App B**, and **App C**.

- Allow traffic from **App A** to **App B**
- Allow traffic from **App A** to **App C**

If traffic and its direction is not explicitly allowed, it is denied. For example, **App B** cannot send traffic to **App C**.



## Overlay network

Container-to-container networking uses an overlay network to manage communication between app instances.

Overlay networks are not externally routable, and traffic sent between containers does not exit the overlay. You can use the same overlay network range for different TAS for VMs deployments in your environment.

The overlay network range defaults to 10.255.0.0/16. You can modify the default to any [RFC 1918](#) range that meets the following requirements:

- The range is not used by services that app containers access.
  - The range is not used by the underlying TAS for VMs infrastructure.

All Diego Cells in your TAS for VMs deployment share this overlay network. By default, each Diego Cell is allocated a /24 range that supports 254 containers per Diego Cell, one container for each of the usable IP addresses, `.1` through `.254`. To modify the number of Diego Cells your overlay network supports, see [Overlay Network](#) in *Configuring Container-to-Container Networking*.

TAS for VMs container networking is currently supported only on Linux.



The overlay network IP address range must not conflict with any other IP addresses in the network. If a conflict exists, Diego Cells cannot reach any endpoint that has a conflicting IP address.



Updating the overlay network will cause container-to-container networking downtime during the deploy while the network update is rolling out across Diego Cells.

Traffic to app containers from the Gorouter or from app containers to external services uses Diego Cell IP addresses and NAT, not the overlay network.

## Policies

Enabling container-to-container networking for your deployment allows you to create policies for communication between app instances. The container-to-container networking feature also provides a unique IP address to each app container and provides direct IP reachability between app instances.

The policies you create specify a source app, destination app, protocol, and port so that app instances can communicate directly without going through the Gorouter, a load balancer, or a firewall. Container-to-container networking supports UDP and TCP, and you can configure policies for multiple ports. These policies apply immediately without having to restart the app.

Additionally, policies use and track the GUIDs of the apps. The policies continue to work when apps redeploy, or if they crash and Diego places them in a new container. Pushing a brand new app requires a new policy, but not updates to an existing app because an app always retains its GUID.

## App service discovery

The TAS for VMs platform supports DNS-based service discovery that lets apps find each other's internal addresses. For example, a front end app instance can use the service discovery mechanism to establish communications with a back end app instance. To set up and use app service discovery, see [App service discovery](#) in *Configuring container-to-container networking*.

Container-to-container app service discovery does not provide client-side load balancing or circuit-breaking, and it does not apply to `cf marketplace` services or require app binding. It just lets apps publish service endpoints to each other, unbrokered and unmediated.

## Alternative network stacks

The BOSH release that contains the container-to-container networking feature is composed of a plug-in network stack. Advanced users or third party vendors can integrate a different network stack. For more information about third party plug-ins, see [3rd Party Plug-in Development for Container Networking](#) in the CF Networking Release repository on GitHub.

## Container-to-container networking versus ASGs

Both app security groups (ASGs) and container-to-container networking policies affect traffic from app instances. The following table highlights differences between ASGs and container-to-container networking policies.

	<b>ASGs</b>	<b>Container-to-Container Networking Policies</b>
<b>Policy granularity</b>	From a space to an IP address range	From a source app to a destination app
<b>Scope</b>	For a space, org, or deployment	For app to app only

ASGs		Container-to-Container Networking Policies
Traffic direction	Outbound control	Policies apply for incoming packets from other app instances
Source app	Is not known	Is identified because of direct addressability
Policies take affect	Immediately	Immediately

## Securing container-to-container traffic

The platform provides a TLS encapsulation for container-to-container network traffic.

To utilize TLS capabilities, the client application can connect to port 61443 on the destination application over HTTPS. Traffic to application container port 61443 is proxied to application port 8080 inside of the container. In this case:

- The platform provides certificates for each app.
- The platform makes sure that TLS ends within the destination container and passes cleartext traffic to the app.
- The destination app does not need special configuration.

Additionally, applications can implement TLS termination in their destination applications. Use this option if your application needs to use more TLS capabilities, like verifying client certificates and rejecting service for those that are not permitted, or if your application needs TLS termination on a different port than the default port, 8080.

Specific Cloud Foundry vendors might provide additional methods for securing container-to-container traffic.

For information about how the platform can encrypt public traffic to apps, see [TLS to Apps and Other Back End Services in HTTP Routing](#).

## App security groups in Cloud Foundry

App Security Groups (ASGs) are a collection of egress rules that enable you to specify the protocols, ports, and IP address ranges where app or task instances send traffic.

ASGs define **allow** rules, and their order of evaluation is unimportant when multiple ASGs apply to the same space or deployment. The platform sets up rules to filter and log outbound network traffic from app and task instances. ASGs apply to both buildpack-based and Docker-based apps and tasks.

## Staging and running ASGs

Admins can define a `staging` ASG for app and task staging, and a `running` ASG for app and task runtime.

When apps or tasks begin staging, they require traffic rules permissive enough to allow them to pull resources from the network. A running app or task no longer needs to pull resources, so traffic rules can be more restrictive and secure. To distinguish between these two security requirements, you can define a `staging` ASG for app and task staging with more permissive rules, and a `running` ASG for app and task runtime with less permissive rules.

## Platform wide and space scoped ASGs

To provide granular control when securing a deployment, you can assign platform-wide ASGs that apply to all app and task instances for the entire deployment, or space-scoped ASGs that apply only to apps and tasks in a particular space.

In environments with both platform-wide and space-specific ASGs, the ASGs for a particular space are combined with the platform ASGs to determine the effective rules for that space. Any of the permitted traffic in the set of applicable ASGs is then effectively permitted for that app.

## Dynamic ASGs

Dynamic ASGs allow ASGs to be applied to apps without the need for an application restart. Containers using the [Silk CNI](#) or NSX-T update their ASGs dynamically; Windows apps and apps using other CNIs do not support Dynamic ASGs at this time.

Dynamic ASGs are enabled with cf deployment v20.0.0 and higher through [cf-networking-release 3.0.0](#). It is recommended to use Dynamic ASGs with capi-release v1.126.0 or later for improved performance on the /v3/security\_groups APIs.

To deactivate Dynamic ASGs: use the ops file `operations/disable-dynamic-asgs.yml` from [cf-deployment v20.0.0](#) or higher.

## Simplifying ASGs with a services subnet

ASGs can be complicated to configure correctly, especially when the specific IP addresses listed in a group change.

To simplify securing a deployment while still allowing apps reach external services, operators can deploy the services into a subnet that is separate from their TAS for VMs deployment, then create ASGs for the apps that allow those service subnets, while denying access to any VM hosting other apps.

For examples of typical ASGs, see [Typical ASGs](#).

## Default ASGs

TAS for VMs defines one default ASG, `default_security_group`. This group allows all outbound traffic from app containers on public and private networks except for the link-local range, `169.254.0.0/16`, which is blocked.

For security, TAS for VMs administrators must modify the default ASGs so that outbound network traffic cannot access internal components. For more information, see [Restricting app access to internal TAS for VMs components](#).

The ASG is defined in the Cloud Controller configuration as follows:

```
security_group_definitions:
- name: default_security_group
  rules:
  - protocol: all
    destination: 0.0.0.0-169.253.255.255
  - protocol: all
    destination: 169.255.0.0-255.255.255.255
```

## ASG sets

ASGs are applied by configuring ASG sets differentiated by *scope*, platform-wide or space specific, and *lifecycle*, staging or running.

Currently, the following ASG sets exist in TAS for VMs:

- Platform-wide staging ASG set, also called “default-staging”
- Platform-wide running ASG set, also called “default-running”
- Space-scoped staging ASG set
- Space-scoped running ASG set

In environments with both platform-wide and space-specific ASG sets, combine the ASG sets for a particular space with the platform ASG sets to determine the rules for that space.

The following table indicates the differences between the four sets:

<b>When an ASG is bound to the...</b>	<b>the ASG rules are applied to...</b>
Platform-wide staging ASG set	the staging lifecycle for all apps and tasks.
Platform-wide running ASG set	the running lifecycle for all app and task instances.
Space-scoped staging ASG set	the staging lifecycle for apps and tasks in a particular space.
Space-scoped running ASG set	the running lifecycle for app and task instances in a particular space.

Typically, ASGs applied during the staging lifecycle are more permissive than the ASGs applied during the running lifecycle. This is because staging often requires access to different resources, such as dependencies.

You use different commands to apply an ASG to each of the four sets.

To apply a staging ASG to apps within a space, you must use cf CLI v6.28.0 or later.

For more information, see [Managing ASGs with the cf CLI](#).

## Structure and attributes of ASGs

ASG rules are specified as a JSON array of ASG objects. An ASG object has the following attributes:

<b>Attribute</b>	<b>Description</b>	<b>Notes</b>
<code>protocol</code>	<code>tcp</code> , <code>udp</code> , <code>icmp</code> , or <code>all</code>	Required
<code>destination</code>	A single IP address, an IP address range like <code>192.0.2.0-192.0.2.50</code> , or a CIDR block that can receive traffic	
<code>ports</code>	A single port, multiple comma-separated ports, or a single range of ports that can receive traffic. Examples: <code>443, 80, 8080, 8081, 8080-8081</code>	Only possible if <code>protocol</code> is <code>tcp</code> or <code>udp</code> .
<code>code</code>	ICMP code	Required when <code>protocol</code> is <code>icmp</code> . A value of <code>-1</code> allows all codes.
<code>type</code>	ICMP	Required when <code>protocol</code> is <code>icmp</code> . A value of <code>-1</code> allows all types.

Attribute	Description	Notes
<code>log</code>	Set to <code>true</code> to enable logging. For more information about how to configure system logs to be sent to a syslog drain, see <a href="#">Using Log Management Services</a> .	Logging is only supported with protocol type <code>tcp</code> .
<code>description</code>	An optional field for operators managing ASG rules	

## Managing ASGs

The following table outlines the flow of tasks that you implement over the lifecycle of ASGs.

For information about procedures for each of these tasks, see [Managing ASGs with cf CLI](#).

Task	For more information, see:
1 Review the existing ASGs. If this is a new deployment, these consist of only the default ASGs.	<a href="#">View ASGs</a>
2 Create new ASGs.	<a href="#">Create ASGs</a>
3 Update the existing ASGs.	<a href="#">Update ASGs</a>
4 Bind ASGs to an ASG set.	<a href="#">Bind ASGs</a>
5 If you need to delete an ASG, first unbind it, then delete it.	<a href="#">Unbind ASGs and Delete ASGs</a>

## Managing ASGs with cf CLI

Learn about the commands you need to create and manage ASGs.

Many of the following procedures require the Cloud Foundry Command Line Interface (cf CLI). To download the cf CLI, see [Installing the cf CLI](#).

## Viewing ASGs

To view information about existing ASGs, run the following commands:

Command	Output
<code>cf security-groups</code>	All ASGs
<code>cf staging-security-groups</code>	All ASGs applied to the platform-wide staging ASG set
<code>cf running-security-groups</code>	All ASGs applied to the platform-wide running ASG set
<code>cf security-group ASG</code>	All rules in the specified ASG, where <code>ASG</code> is the name of the ASG



You can also view ASGs in Apps Manager under the **Settings** tab of a space or an app.

## Creating ASGs

To create an ASG:

1. Create a rules file: a JSON-formatted single array containing objects that describe the rules. See the following example, which allows ICMP traffic of code `1` and type `0` to all destinations, and TCP traffic to `10.0.11.0/24` on ports `80` and `443`. For more information, see [The Structure and Attributes of ASGs](#).

```
[  
  {  
    "protocol": "icmp",  
    "destination": "0.0.0.0/0",  
    "type": 0,  
    "code": 0  
  },  
  {  
    "protocol": "tcp",  
    "destination": "10.0.11.0/24",  
    "ports": "80,443",  
    "log": true,  
    "description": "Allow http and https traffic to ZoneA"  
  }  
]
```

2. Run:

```
cf create-security-group ASG PATH-TO-RULES-FILE.json
```

Where:

- `ASG` is the name of your ASG.
- `PATH-TO-RULES-FILE.json` is the absolute or relative path to a rules file.

In the following example, `EXAMPLE-ASG` is the name of an ASG, and `~/workspace/example-asg.json` is the path to a rules file:

```
cf create-security-group EXAMPLE-ASG ~/workspace/example-asg.json
```

After the ASG is created, you must bind it to an ASG set before it takes effect. For more information, see [Bind ASGs](#).

## Binding ASGs

Binding an ASG does not affect started apps unless you have [Dynamic ASGs](#) enabled. If deactivated, you need to run `cf restart` for each app. To restart all of the apps in an org or a space, use the [app-restart](#) cf CLI plug-in.

To apply an ASG, you must bind it to an ASG set.

### Platform-wide staging ASG set

To bind an ASG to the platform wide staging ASG set:

1. Run:

```
cf bind-staging-security-group ASG
```

Where `ASG` is the name of your ASG.

### Platform-wide running ASG set

To bind an ASG to the platform-wide running ASG set:

1. Run:

```
cf bind-running-security-group ASG
```

Where `ASG` is the name of your ASG.

### Space-scoped running ASG set

To bind an ASG to a space-scoped running ASG set:

1. Run:

```
cf bind-security-group ASG ORG --space SPACE
```

Where:

- `ASG` is the name of your ASG.
- `ORG` is the name of the org where you want to bind the ASG set.
- `SPACE` is the name of the space where you want to bind the ASG set.

### Space-scoped staging ASG set

To bind an ASG to a space scoped staging ASG set:

1. Run:

```
cf bind-security-group ASG ORG --space SPACE --lifecycle staging
```

Where:

- `ASG` is the name of your ASG.
- `ORG` is the name of the org where you want to bind the ASG set.
- `SPACE` is the name of the space where you want to bind the ASG set.

## Update ASGs

Updating an ASG does not affect started apps unless you have [Dynamic ASGs](#) activated. If deactivated, you need to restart the apps. To restart all of the apps in an org or a space, use the [app-restart](#) cf CLI plug-in.

To update an existing ASG: 1. Edit the ASG rules in the JSON file you created in [Create ASGs](#).

1. Run:

```
cf update-security-group ASG PATH-TO-RULES-FILE.json
```

Where:

- **ASG** is name of the existing ASG you want to change.
- **PATH-TO-RULES-FILE.json** is the absolute or relative path to a rules file.

In the following example, `example-asg` is the name of an ASG, and `~/workspace/example-asg-v2.json` is the path to a rules file:

```
cf update-security-group example-asg ~/workspace/example-asg-v2.json
```

## Unbind ASGs

Unbinding an ASG does not affect started apps unless you have [Dynamic ASGs](#) enabled. If deactivated, you need to restart the apps. To restart all of the apps in an org or a space, use the [app-restarter](#) cf CLI plug-in.

### Platform-wide staging ASG set

To unbind an ASG from the platform-wide staging ASG set:

1. Run:

```
cf unbind-staging-security-group ASG
```

Where **ASG** is the name of your ASG.

### Platform-wide running ASG set

To unbind an ASG from the platform-wide running ASG set:

1. Run:

```
cf unbind-running-security-group ASG
```

Where **ASG** is the name of your ASG.

### Space-scoped ASG set

To unbind an ASG from a specific space:

1. Run:

```
cf unbind-security-group ASG ORG --space SPACE --lifecycle running
```

Where:

- **ASG** is the name of your ASG.
- **ORG** is the org where you want to unbind the ASG set.
- **SPACE** is the space where you want to unbind the ASG set.

- To unbind from the staging ASG set, replace `running` with `staging`.

## Delete ASGs

You can only delete unbound ASGs. To unbind ASGs, see [Unbind ASGs](#).

To delete an ASG:

1. Run:

```
cf delete-security-group ASG
```

Where `ASG` is the name of your ASG.

## Typical ASGs

The following table describes examples of typical ASGs. Configure your ASGs in accordance with your organization's network access policy for untrusted apps.

ASG	For access to:
<code>dns</code>	DNS, either public or private
<code>public-networks</code>	Public networks, excluding IaaS metadata endpoints
<code>private-networks</code>	Private networks in accordance with <a href="#">RFC-1918</a>
<code>load-balancers</code>	The internal TAS for VMs load balancer and others
<code>internal-proxies</code>	Internal proxies
<code>internal-databases</code>	Internal databases

## DNS

To resolve hostnames to IP addresses, apps require DNS server connectivity, which typically use port 53. Admins must create or update a `dns` ASG with appropriate rules. Admins can further restrict the DNS servers to specific IP addresses or ranges of IP addresses.

The following is an example `dns` ASG:

```
[
  {
    "protocol": "tcp",
    "destination": "0.0.0.0/0",
    "ports": "53"
  },
  {
    "protocol": "udp",
    "destination": "0.0.0.0/0",
    "ports": "53"
  }
]
```

## Public networks

Apps often require public network connectivity to retrieve app dependencies, or to integrate with services available on public networks. Example app dependencies include public Maven repositories, NPM, RubyGems, and Docker registries.

You must exclude IaaS metadata endpoints. For example, `169.254.169.254`, because the metadata endpoint can expose sensitive environment information to untrusted apps. The following `public_networks` example accounts for this recommendation.

The following is an example `public_networks` ASG:

```
[
  {
    "destination": "0.0.0.0-9.255.255.255",
    "protocol": "all"
  },
  {
    "destination": "11.0.0.0-169.253.255.255",
    "protocol": "all"
  },
  {
    "destination": "169.255.0.0-172.15.255.255",
    "protocol": "all"
  },
  {
    "destination": "172.32.0.0-192.167.255.255",
    "protocol": "all"
  },
  {
    "destination": "192.169.0.0-255.255.255.255",
    "protocol": "all"
  }
]
```

## Private networks

Network connections that are commonly allowable in private networks include endpoints such as proxy servers, Docker registries, load balancers, databases, messaging servers, directory servers, and file servers. Configure appropriate private network ASGs as appropriate. You might find it helpful to use a naming convention with `private_networks` as part of the ASG name, such as `private_networks_databases`.

You must exclude any private networks and IP addresses that app and task instances must not have access to.

The following is an example `private_networks` ASG:

```
[
  {
    "protocol": "tcp",
    "destination": "10.0.0.0-10.255.255.255",
    "ports": "443"
  },
  {
    "protocol": "tcp",
    "destination": "172.16.0.0-172.31.255.255",
    "ports": "443"
  }
]
```

```

},
{
  "protocol": "tcp",
  "destination": "192.168.0.0-192.168.255.255",
  "ports": "443"
}
]

```

## ASGs and Performance on Windows

Each ASG bound to an app results in one or more network policy created on the Host, depending on the number of destinations (ranges and CIDRs count as one destination each). Windows apps with ASGs to many destinations will experience increased latency when the app is starting. Windows apps with ASGs to more than 1000 destinations may fail to start.

## Marketplace Services

Each installed Marketplace Service requires its own set of ASG rules to function properly. To determine which ASG rules it requires, see the installation instructions for each installed Marketplace Service. For more information about how to provision and integrate services, see [Services Overview](#).

## About the ASG Creator tool

The ASG Creator is a command line tool that you can use to create JSON rules files. The ASG Creator lets you specify IP addresses, CIDRs, and IP address ranges that you want to disallow traffic to, as well as the addresses that you want to allow traffic to. Based on these disallow/allow (exclude/include) lists that you provide as input, the ASG Creator formulates a JSON file of allow rules.

In turn, the JSON file is the input for the `cf create-security-group` command that creates an ASG.

To download the latest release of the ASG Creator, see the [Cloud Foundry Incubator](#) repository on GitHub.

## ASG logging

For information about how you can use ASGs to correlate emitted logs back to an app, see [How to use Application Security Group \(ASG\) logging](#) in the Tanzu Support Hub.

## Restricting app access to internal TAS for VMs components

You can secure the virtual machines (VMs) component of your VMware Tanzu Application Service for VMs (TAS for VMs) deployment from being accessed by apps. Here are the instructions.

## App access basics

See the following list to interpret the concepts for this topic:

- **How TAS for VMs determines where apps can send traffic:**
  - TAS for VMs uses *App Security Groups (ASGs)*, which are network policy rules specifying protocols, ports, and IP ranges that apply to outbound network connections initiated from apps. For more information, see [App Security Groups](#).

- **Why you must create new rules for outbound app traffic:**
  - TAS for VMs installs with a default ASG that you can run for apps on your deployment that send traffic to almost any IP address. This results in apps not being blocked from initiating connections to most network destinations unless an administrator takes action to update the ASGs with a more restrictive policy. For more information, see the [Default ASGs](#) section of the [App Security Groups](#) topic.
- **How you can set up new rules:**
  - To help secure your component VMs against apps while ensuring your apps can access the services they need, follow the steps in the [Procedure](#) section, which includes:

Step	Description
1	<p><a href="#">Determine your network layout:</a>            The procedure for securing your deployment with ASGs varies depending on your network layout, which you can determine using Tanzu Operations Manager.</p>
2	<p><a href="#">Ensure access for TAS for VMs system apps</a>            Bind the default ASG to the <code>system</code> org so that TAS for VMs system apps can continue accessing the system components they need after you remove the deployment-wide default ASG in Step 4.</p>
3	<p><a href="#">Create new ASGs:</a>            Block apps from sending traffic to system components, but allow them to send traffic to the services they need.</p>
4	<p><a href="#">Remove the default ASG:</a>            After you create and bind new ASGs, you no longer need the deployment-wide default ASG bindings that allow apps to send traffic to any IP.</p>
5	<p><a href="#">Restart your apps:</a>            To apply the ASG changes, you must restart all of the apps in your deployment.</p>

- **When to set up new rules:**

- VMware recommends that you complete this procedure directly after installing TAS for VMs and before developers push apps to the platform. If you complete the procedure after apps have been pushed to the platform, you must start all the apps again in your deployment.

## Prerequisites

The procedure section requires that you have the latest release of [ASG Creator](#) from the Cloud Foundry incubator repository on GitHub. For more information, see the [About the ASG Creator Tool](#) section of the [App Security Groups](#) topic.

## Procedure

This procedure outlines how to apply ASGs that prevent apps running on your deployment from accessing internal TAS for VMs components.

### Step 1: Determine your network layout

The procedure for securing your deployment with ASGs varies depending on your network layout. To determine your network layout:

1. Log in to Tanzu Operations Manager.
2. For each tile, click **Assign AZs and Networks** and record the selected **Network** that the tile is installed on.
3. Based on the information you gathered, determine which of the following network layouts you have:

Layout name	Layout description
One network	<ul style="list-style-type: none"> <li>o One network for Tanzu Operations Manager and the BOSH Director, TAS for VMs, and services.</li> </ul> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  <b>Caution</b>            You cannot secure your deployment with ASGs if you have this network layout. Because Operations Manager dynamically allocates IPs, they cannot be easily excluded in the case of a single network.         </div>
Two networks	<ul style="list-style-type: none"> <li>o One network for Tanzu Operations Manager and the BOSH Director.</li> <li>o One network for TAS for VMs and Services.</li> </ul>
Three networks	<ul style="list-style-type: none"> <li>o One network for Tanzu Operations Manager and the BOSH Director.</li> <li>o One network for TAS for VMs.</li> <li>o One network for all services.</li> </ul>
Three or more networks	<ul style="list-style-type: none"> <li>o One network for Tanzu Operations Manager and the BOSH Director.</li> <li>o One network for TAS for VMs.</li> <li>o One network for each service.</li> </ul>

4. If your network layout includes two or more networks, continue to [Step 2: Ensure Access for TAS for VMs System Apps](#).

## Step 2: Ensure access for TAS for VMs system apps

Applying the default ASG to the platform-wide staging and running ASG sets provides network access to TAS for VMs system apps without restrictions, which activates them to continue functioning properly after you perform [Step 4: Remove the Deployment-wide Default ASG Binding](#). To apply the default ASG to the staging and running ASG sets:

1. Bind the default ASG to the platform-wide staging ASG set:

```
cf bind-staging-security-group default_security_group
```

2. Bind the default ASG to the platform-wide running ASG set:

```
cf bind-running-security-group default_security_group
```

For more information about staging and running sets, see the [ASG Sets](#) section of the *App Security Groups* topic.

## Step 3: Create new ASGs

This step outlines how to create ASGs that block apps from accessing TAS for VMs components and create any additional ASGs that allow apps to access the services they require.

### Part A: Record CIDRs

To gather the CIDRs for each network in your deployment:

1. From the BOSH Director tile, click **Create Networks** within the **Settings** tab.
2. In the **Networks** section, expand each network in your deployment by clicking its name.
3. Record the **CIDR** for each network.

### Part B: Create and bind ASGs that block network access

To create ASGs that block apps from sending traffic to the networks that host Tanzu Operations Manager, TAS for VMs, and, optionally, any installed services:

1. Create a `config.yml` containing the appropriate content for your network layout and replace the indicated values with the CIDRs you gathered:

- o **Two-network layout:**

```
exclude:
- YOUR-OPS-MANAGER-CIDR
- YOUR-TAS-AND-SERVICES-CIDR
```

- o **Three-network layout:**

If you want to secure only the Tanzu Operations Manager and TAS for VMs components, you can remove the services CIDR from the `exclude` section.

```
exclude:
- YOUR-OPS-MANAGER-CIDR
- YOUR-TAS-CIDR
- YOUR-SERVICES-CIDR
```

- o **Three or more network layout:**

If you want to secure only the Tanzu Operations Manager and TAS for VMs components, you can remove the services CIDRs from the `exclude` section.

```
exclude:
- YOUR-OPS-MANAGER-CIDR
- YOUR-TAS-CIDR
- YOUR-SERVICE-CIDR-1
- YOUR-SERVICE-CIDR-2
etc...
```

- To generate the `public-networks.json` and `private-networks.json` default files that contain your ASG rules, specify the location of the `config.yml` file as input, and run:

```
asg-creator create --config config.yml
```

- Create the `public-networks` ASG by running:

```
cf create-security-group public-networks public-networks.json
```

- Bind the ASG to the default staging set by running:

```
cf bind-staging-security-group public-networks
```

- Bind the ASG to the default running set by running:

```
cf bind-running-security-group public-networks
```

- Create the `private-networks` ASG by running:

```
cf create-security-group private-networks private-networks.json
```

- Bind the ASG to the default staging set by running:

```
cf bind-staging-security-group private-networks
```

- Bind the ASG to the default running set by running:

```
cf bind-running-security-group private-networks
```

To create and bind additional ASGs, see the [Create ASGs](#) and [Bind ASGs](#) sections of the *App Security Groups* topic.

### Part C: Create and bind ASGs for service access

This part is only necessary if you blocked apps from a network that hosts services in the previous part.

If you did not block apps from a network that hosts services, proceed to [Step 4: Remove the Default ASG](#).



#### Important

In the two network layout, TAS for VMs and services share the same network. This means that each time you create an ASG that allows apps to access a new port and protocol within the network, you further expose the TAS for VMs component VMs. This is a limitation of a two network layout. For guidance on network topology, see [Reference Architecture](#).

Now that you have created ASGs to secure the Tanzu Operations Manager, TAS for VMs, and service components, you can create additional ASGs that give apps access to the services they need.

For more information about creating and binding ASGs, see the [Managing ASGs with the cf CLI](#) and [Typical ASGs](#) sections of the *App Security Groups* topic.

## Step 4: Remove the default ASG

Now that you have bound new ASGs to determine outbound traffic rules, you no longer need the default ASG bindings that allow apps to send traffic to any IP address. To remove the default ASG:

1. Unbind the default ASG from the staging set by running:

```
cf unbind-staging-security-group default_security_group
```

2. Unbind the default ASG from the running set by running:

```
cf unbind-running-security-group default_security_group
```

## Step 5: Restart your apps

To apply the ASG changes, you must start all of the apps in your deployment again. To mitigate app downtime during the restart, VMware recommends a blue-green deployment strategy. For more information, see [Using Blue-Green Deployment to Reduce Downtime and Risk](#).

To restart all of the apps in your deployment:

1. Work with developers to restart a few of their apps individually and test that they still work correctly with the new ASGs in place. If an app does not work as expected, you likely must create another ASG that allows the app to send traffic to a service it requires.



### Note

You do not have to restart the apps in the `system` org. To quickly roll back to the original overly permissive state, you can rebind the `default_security_group` ASG to the `default-staging` and `default-running` sets. You must then restart your apps to reapply the original ASGs

2. Restart the rest of the apps running on your deployment. You can use the `app-restarter` cf CLI plugin to restart all apps in a particular space, org, or deployment.

## Certificates and Credentials

In this section:

- [Rotating runtime CredHub encryption keys](#)
- [Rotating the Cloud Controller Database encryption key](#)
- [Securing service instance credentials with runtime CredHub](#)
- [Providing a certificate for your TLS termination point](#)
- [Trusted system certificates](#)
- [Bulletin Board System data store encryption](#)
- [CredHub](#)
  - [CredHub credential types](#)

- Backing up and restoring CredHub instances
- Using hardware security modules with CredHub
- Using a key management service with CredHub
- Setting up and deploying CredHub with BOSH
- Troubleshooting CredHub

## Rotating runtime CredHub encryption keys

You can rotate CredHub encryption keys for VMware Tanzu Application Service for VMs (TAS for VMs).

Encryption keys are values that CredHub uses to obscure stored secrets. When an operator marks an additional key as primary, CredHub can rotate in that additional key as the encryption key.

During this credential rotation process, the initial encryption key is used to access the hidden value. That value is then stored again by the additional encryption key.



### Caution

If you remove an encryption key and click **Apply Changes** before the rotation completes, the deployment breaks. If this happens, you can no longer access data stored with the deleted key.

## Rotate TAS for VMs encryption keys

To rotate TAS for VMs encryption keys:

1. Go to the **Tanzu Operations Manager Installation Dashboard**.
2. Click the TAS for VMs tile.
3. Select **CredHub**.
4. In the **Encryption Keys** section, click **Add**.
5. For **Name**, enter the name of your new encryption key.
6. For **Key**, enter your new encryption key.
7. Select the **Primary** check box.
8. Click **Save**.
9. Go to **Tanzu Operations Manager Installation Dashboard**.
10. Click **Review Pending Changes**, then **Apply Changes**.

## Verify encryption key rotation

To verify that the rotation completes:

1. Click the TAS for VMs tile.
2. Select the **Status** tab.
3. Within the **CredHub** job, locate **Index 0**.

JOB	INDEX	IPS	AZ	CID	LOAD AVG1S	CPU	MEMORY	SWAP	SYSTEM DISK	EPHEM. DISK	PERS. DISK	LOGS
Consul	0	10.0.4.5	us-central1-a	vm-dca0a175-3a56-4cb0-6b64-2d3f0a39ddc7	0.00	1.2%	14%	0%	40%	3%	3%	
NATS	0	10.0.4.6	us-central1-a	vm-a5b7a6e3-d80d-44d2-54cc-a160d3f6916	0.00	1.1%	14%	0%	40%	3%	N/A	
File Storage	0	10.0.4.7	us-central1-a	vm-c4aa5642-54f9-436e-5c31-03b2607de077	0.00	1.0%	4%	0%	40%	7%	3%	
MySQL Proxy	0	10.0.4.8	us-central1-a	vm-c6df54cc-128c-440b-4835-e2826b9502be	0.00	0.3%	15%	0%	40%	4%	N/A	
MySQL Server	0	10.0.4.9	us-central1-a	vm-5ec3aa62-f066-42e0-60ec-ce4464cf628	0.08	1.1%	24%	0%	40%	3%	5%	
Backup Prepare Node	0	10.0.4.10	us-central1-a	vm-55e93a88-ce00-4519-4ccb-39b12bd82495	0.00	0.3%	19%	0%	40%	20%	0%	
Diego BBS	0	10.0.4.11	us-central1-a	vm-c95a4858-b9fb-460e-4693-1dfd1f3be88d	0.03	1.1%	20%	0%	40%	5%	N/A	
UAA	0	10.0.4.12	us-central1-a	vm-9f5c1fdc-704e-484c-7e89-58c95a19a319	0.02	0.6%	20%	0%	40%	3%	N/A	
Cloud Controller	0	10.0.4.13	us-central1-a	vm-6ec5f788-a390-45ed-4990-9cbd3f6aeee6	0.07	1.0%	27%	0%	40%	16%	N/A	
HAProxy	0	10.0.4.14	us-central1-a	vm-9466dc03-d2bc-48f0-401b-d9082e0f8778	0.00	0.5%	14%	0%	40%	3%	40%	
Router	0	10.0.4.15	us-central1-a	vm-32ba827f-564b-4462-7b20-46a658a8e8df	0.00	1.2%	16%	0%	40%	4%	N/A	
MySQL Monitor	0	10.0.4.16	us-central1-a	vm-98c9c06c-e381-455f-517c-62e9ad9d70d1	0.00	0.2%	11%	0%	40%	2%	N/A	
Clock Global	0	10.0.4.17	us-central1-a	vm-65a93076-941e-4b4c-50a2-e067bfe2d0ed	0.00	0.3%	41%	1%	40%	86%	N/A	
Cloud Controller Worker	0	10.0.4.18	us-central1-a	vm-de45f832-e290-4e38-7692-236fa5b417d5	0.00	1.1%	48%	1%	40%	9%	N/A	
Diego Brain	0	10.0.4.19	us-central1-a	vm-247bcf3-9241-49df-57fd-7c34d8bb9fef	0.00	0.4%	9%	0%	41%	6%	0%	
Diego Cell	0	10.0.4.20	us-central1-a	vm-99761423-b711-4871-7aa9-848537f5096e	0.07	0.6%	12%	0%	40%	8%	N/A	
Loggregator Trafficcontroller	0	10.0.4.21	us-central1-a	vm-37c47ff42-f226-4728-6acc-d4351a7d06cc	0.00	1.4%	18%	0%	40%	4%	N/A	
Syslog Adapter	0	10.0.4.22	us-central1-a	vm-9c577460-1a29-4741-7a0b-e70d6d93b286	0.00	1.1%	14%	0%	40%	3%	N/A	
Syslog Scheduler	0	10.0.4.23	us-central1-a	vm-43a14a07-aaae-466d-6839-23767c3ce141	0.00	0.4%	14%	0%	40%	3%	N/A	
Doppler Server	0	10.0.4.24	us-central1-a	vm-66359c07-0ef4-4a42-542c-2e7ceee9e4be5	0.05	1.5%	19%	0%	40%	4%	N/A	
<b>CredHub</b>	0	10.0.4.25	us-central1-a	vm-84b31970-374a-4e0c-411c-3977b6a20ff1	0.00	0.2%	12%	0%	40%	7%	N/A	
	1	10.0.4.26	us-central1-b	vm-b67b89d6-0415-4021-7950-48c6c3aa2b14	0.00	0.2%	12%	0%	40%	7%	N/A	

4. In the **Logs** column, click the correlating download icon.
5. Select the **Logs** tab.
6. Click the corresponding link to retrieve the downloaded log file.
7. Unzip the log file.
8. Unzip the larger of the two nested directories.
9. Tanzu Operations Manager generates a compressed file for each CredHub VM that exists on your deployment. Unzip each of these compressed files.
10. Open the `credhub` directory.
11. Open the `credhub.log` file. If the credential rotation completed successfully, the CredHub log contains the following string: `Successfully rotated NUMBER-OF-CREDENTIALS items`
12. Remove the old encryption key.
13. Click the trashcan icon that corresponds to the old encryption key.
14. Click **Save**.
15. Go to the **Tanzu Operations Manager Installation Dashboard**.
16. Click **Review Pending Changes**, then **Apply Changes**.

## Rotating the Cloud Controller database encryption key

You can rotate the Cloud Controller database (CCDB) encryption key.

The Cloud Controller is the primary API of VMware Tanzu Application Service for VMs (TAS for VMs). It has its own database, the CCDB, in which it stores information about objects in TAS for VMs such as apps. The

CCDB encryption key is used to encrypt sensitive data at rest in the CCDB such as app environment variables.

The CCDB encryption key is automatically generated when you first deploy TAS for VMs. For example, you might want to perform this procedure if your existing key is leaked.

## Rotate the CCDB encryption key



### Important

Do not edit the **Cloud Controller database encryption key** field in the TAS for VMs tile. This field is only for use when restoring TAS for VMs from a backup. If you edit this value at a time other than restore, commands such as `cf push` might fail. Instead, change keys using the **Encryption key ledger**.

To rotate the CCDB encryption key:

1. Go to the TAS for VMs tile in Tanzu Operations Manager and select the **Cloud Controller** pane.
2. Review the **Encryption key ledger** field. If you previously added a key and activated the **Primary** check box, deselect the check box. The TAS for VMs deploy fails if there is more than one key with the **Primary** check box selected.
3. In the **Encryption key ledger** field:



### Important

Do not remove any existing keys until after you complete the last step of this procedure. Removing keys now causes the TAS for VMs deploy to fail.

1. Click **Add**.
2. Enter values for **Encryption key name** and **Encryption key**.
3. Activate the check box to mark this as your **Primary** key.
4. Click **Save**.
5. Select the **Errands** pane.
6. Set the **Rotate CC Database Key** errand to **On**.
7. Click **Save**.
8. Redeploy TAS for VMs. After TAS for VMs deploys and the errand runs successfully, you can remove any previously specified CCDB encryption keys in the ledger.

## Troubleshoot failed rotation

This section describes how to troubleshoot errors that you might encounter while rotating the CCDB encryption key.

### Error: Encryption key(s) have had their values changed

<b>Error</b>	The TAS for VMs deploy fails with a Cloud Controller error. The Cloud Controller logs include the following message: <code>Encryption key(s) mykey have had their values changed. Label and value pairs must not change, rather a new label and value pair can be added.</code>
<b>Cause</b>	TAS for VMs does not support editing key names or values in the ledger. A previously existing key was edited in the TAS for VMs UI. For example, a key with the name <code>key-name</code> previously had the value <code>key-value-1</code> and now it is <code>key-value-2</code> .
<b>Solution</b>	<p>Replace the value for the key with its original value and follow the rotation procedure to add a new key.</p> <p>You need to find the original value of the key using the steps in <a href="#">View Encryption Keys</a>.</p>

## Error: Encryption key(s) are still in use but not present in 'cc.database\_encryption.keys'

<b>Error</b>	The TAS for VMs deploy fails with a Cloud Controller error. The Cloud Controller logs include the following message: <code>Encryption key(s) mykey are still in use but not present in 'cc.database_encryption.keys'</code>
<b>Cause</b>	A previous key was removed from the ledger in the TAS for VMs UI before the key rotation errand ran.
<b>Solution</b>	<p>Add the previously used key back to the ledger and redeploy TAS for VMs.</p> <p>You might need to find the value of the previously used key using the steps in <a href="#">View Encryption Keys</a>.</p>

## View encryption keys

You can retrieve the value of an existing or previous encryption key. You might need to do this when troubleshooting a failed key rotation.

### Tanzu Operations Manager actual-installation.yml

The Tanzu Operations Manager `actual-installation.yml` file shows properties from the most recent successful deploy. To view the encryption keys listed in this file:

- Follow the steps in [Modify the Installation Files](#) in *Modifying Your Tanzu Operations Manager Installation and Product Template Files* to decrypt the `actual-installation.yml` file.
- Open the `actual-installation.yml` file and view the `cloud_controller_encryption_keys` property.

### CredHub

To view current and previous encryption keys using CredHub:

- Follow the steps in [How to access CredHub with the CredHub CLI](#) to log in to the CredHub CLI.
- Run the following command to view the five most recent encryption keys:

```
credhub get -n /opsmgr/TAS-GUID/cloud_controller/INDEX/encryption_keys --version=5
```

Where:

- `TAS-GUID` is the GUID of your TAS for VMs BOSH deployment.

- `INDEX` is the zero-based index of the key. This corresponds to the order of the **Encryption key ledger** in the Tanzu Operations Manager UI.

## Securing services instance credentials with CredHub

You can ensure service instance credentials are securely stored in runtime CredHub.

The VMware Tanzu Application Service for VMs (TAS for VMs) tile includes its own CredHub component, separate from the CredHub component included with the BOSH Director tile. For more information about this centralized credential management component, see the [CredHub](#) documentation.

## Configure TAS for VMs to use CredHub

Runtime CredHub exists to securely store service instance credentials. Previously, TAS for VMs can only use the Cloud Controller database for storing these credentials.

When developers want their app to use a service, such as those provided by Spring Cloud Services for VMware Tanzu, they must bind their app to an instance of that service. Service bindings include credentials that developers can use to access the service from their app. For more information, see [Binding credentials](#).

To ensure that service instance credentials are stored in runtime CredHub, you must configure TAS for VMs to activate this capability. Not all services support the use of runtime CredHub.

TAS for VMs supports services that do and do not use runtime CredHub. Services that do not use runtime CredHub continue to pass their credentials to the Cloud Controller database.

Runtime CredHub supports credential rotation. For more information, see [Rotating Runtime CredHub Encryption Keys](#).

## Services that use secure binding credentials

The procedures in this document are only effective for services that support storing their instance credentials in runtime CredHub. To learn whether a service supports this feature, see the table below or the documentation for that service.

Service	Versions with secure binding credentials	Broadcom Support listing
VMware GemFire for Tanzu Application Service	v1.7 and later	<a href="#">VMware GemFire</a>
CredHub Service Broker	All	<a href="#">CredHub Service Broker</a>
VMware Tanzu SQL [MySQL]	v2.3 and later (available to user groups only)	<a href="#">VMware Tanzu SQL [MySQL]</a>
RabbitMQ for VMware Tanzu [VMs]	v1.12 and later	<a href="#">RabbitMQ for VMware Tanzu [VMs]</a>
Redis for VMware Tanzu	v1.13 and later	<a href="#">Redis for VMware Tanzu</a>
Spring Cloud Services for VMware Tanzu	v1.5 and later	<a href="#">Spring Cloud Services for VMware Tanzu</a>

## Prerequisites

Runtime CredHub allows you to use one or more Hardware Security Modules (HSMs) to store encryption keys. If you wish to use an HSM with CredHub, you must configure the HSM before completing the following procedures. For more information, see [Preparing CredHub HSMs for Configuration](#).

## Step 1: Configure the TAS for VMs tile

To configure the TAS for VMs tile to support securing service instance credentials in CredHub, you must:

- In the **CredHub** pane, provide at least one encryption key. CredHub supports multiple encryption key providers.
- In the **Resource Config** pane, set the number of **CredHub** instances to at least one.

CredHub configuration options include:

- Internal or external databases
- Encryption keys stored internally, externally in a Hardware Security Module (HSM), or both

To configure the TAS for VMs tile, start with [Prerequisites](#).

## Step 2: Create app security groups

App Security Groups (ASGs) are network policy rules specifying protocols, ports, and IP ranges that apply to outbound network connections initiated from apps.

The default ASGs in Operations Manager allow apps running on your deployment to send traffic to almost any IP address. This step is only required if your ASGs restrict network access from apps to the network on which TAS for VMs runs. For more information, see [Restricting App Access to Internal TAS for VMs Components](#).

To ensure the ASGs for your deployment allow apps to communicate with the runtime CredHub API:

1. From the TAS for VMs tile, click **Assign AZs and Networks** and record the selected network where the tile is installed.
2. From the BOSH Director tile, in the **Settings** tab, click **Create Networks**.
3. In the **Networks** section, click the name of the TAS for VMs network to expand it.
4. Record the CIDR for the TAS for VMs network.
5. Create a file named `runtime-credhub.json` for specifying your ASG rules. Copy the following content into the file. Replace `YOUR-TAS-CIDR` with the CIDR you recorded in the previous step.

```
[  
  {  
    "protocol": "tcp",  
    "destination": "YOUR-TAS-CIDR",  
    "ports": "8844"  
  }  
]
```

6. Create an ASG that allows apps to access the CredHub API by running:

```
cf create-security-group runtime-credhub ~/workspace/runtime-credhub runtime-credhub.json
```

7. Bind this ASG to your deployment or the specific space in which you want apps to access CredHub. For more information about binding ASGs, see the [Bind ASGs](#) section of the *App Security Groups* topic. Ensure that apps deployed as part of the service tile installation process have access to CredHub in addition to the apps pushed to the platform by developers. For example, the Spring Cloud Services for VMware Tanzu tile deploys the `spring-cloud-broker` app to the `p-spring-cloud-services` space of the `system` org.
8. Restart apps for the ASGs to take effect. Optionally, you can use the `app-restart` cf CLI plug-in to restart all apps in a particular space, org, or deployment.

## Step 3: Unbind and rebinding service instances

For any service instance bindings that existed before runtime CredHub was supported for that service, you must work with your developers to unbind and rebinding the service instances to their apps. If you do not unbind and rebinding the service, apps continue functioning as normal and fetching credentials from the Cloud Controller database.



### Important

This step is not required for bindings created after you installed the new version of the service tile that supports CredHub and you completed the procedures in steps 1 and 2 of this topic.

To unbind and rebinding your service instances to their apps:

1. Unbind the service instance from the app by running:

```
cf unbind-service YOUR-APP YOUR-SERVICE-INSTANCE
```

Where:

- `YOUR-APP` is the app that you bound the service instance.
- `YOUR-SERVICE-INSTANCE` is the service instance you want to unbind from the app.

2. Rebind the service instance to the app by running:

```
cf bind-service YOUR-APP YOUR-SERVICE-INSTANCE
```

Where:

- `YOUR-APP` is the app from which you unbound the service instance.
- `YOUR-SERVICE-INSTANCE` is the service instance you want to rebind to the app.

3. Review the `VCAP_SERVICES` environment variable to verify that the new service instance binding includes CredHub pointers by running:

```
cf env YOUR-APP
```

Where `YOUR-APP` is the app to which you bound the service instance.

For help parsing the output of the `cf-env` command, see [VCAP\\_SERVICES](#) in *TAS for VMs Environment Variables*.

4. Start the app again to apply the service instance binding by running:

```
cf restart YOUR-APP
```

Where `YOUR-APP` is the app to which you bound the service instance.

If you run `cf-env` again, you can see the `VCAP-SERVICES` environment variable now contains the credentials for the service instance binding.

## Providing a certificate for your TLS termination point

You can configure Transport Layer Security (TLS) termination for HTTP traffic in VMware Tanzu Application Service for VMs (TAS for VMs) with a TLS certificate, as part of the process of configuring TAS for VMs for deployment.

### Configure TLS termination

When you deploy Operations Manager, you must configure the TLS termination for HTTP traffic in your TAS for VMs configuration. You can terminate TLS at all of these points:

- Load balancer
- Load balancer and the Gorouter
- The Gorouter

To choose and configure the TLS termination option for your deployment, see [TLS Termination Options for HTTP Routing](#) in *Securing Traffic into TAS for VMs*.

### Obtain TLS certificates

To secure traffic into Operations Manager, you must obtain at least one TLS certificate. For general certificate requirements for deploying Operations Manager, see [Certificate Requirements](#) in *Securing Traffic into TAS for VMs*.

For additional IaaS-specific certificate requirements:

- [AWS: Certificate Requirements on AWS](#)
- [Azure: Certificate Requirements on Azure](#)
- [GCP: Certificate Requirements on GCP](#)
- [OpenStack: Certificate Requirements on OpenStack](#)
- [vSphere: Certificate Requirements on vSphere](#)

### Create a wildcard certificate for Operations Manager deployments

You can create or generate a certificate for your TAS for VMs environment. If you are deploying to a production environment, you must obtain a certificate from a trusted Certificate Authority (CA).

For internal development or testing environments, you have two options for creating a required TLS certificates:

- You can create a self-signed certificate, or
- You can have TAS for VMs generate the certificate for you.

To create a certificate, you can use a wide variety of tools including OpenSSL, Java's keytool, Adobe Reader, and Apple's Keychain to generate a Certificate Signing Request (CSR).

In either case for either self signed or trusted single certificates, apply these rules when creating the CSR:

- Specify your registered wildcard domain as the `Common Name`, where `DOMAIN` is your registered wildcard domain. For example, `*.DOMAIN.com`.
- VMware recommends using a split domain configuration that separates the domains for `apps` and `sys` components. To use a split domain configuration, enter these values in the `Subject Alternative Name` of the certificate, where `DOMAIN` is your registered wildcard domain:
  - `*.apps.DOMAIN.com`
  - `*.sys.DOMAIN.com`
  - `*.login.sys.DOMAIN.com`
  - `*.uaa.sys.DOMAIN.com`
- If you are using a single domain configuration, use these values as the `Subject Alternative Name` of the certificate, where `DOMAIN` is your registered wildcard domain:
  - `*.login.sys.DOMAIN.com`
  - `*.uaa.sys.DOMAIN.com`

TLS certificates generated for wildcard DNS records only work for a single domain name component or component fragment. For example, a certificate generated for `*.DOMAIN.com` does not work for `*.apps.DOMAIN.com` and `*.sys.DOMAIN.com`. The certificate must have both `*.apps.DOMAIN.com` and `*.sys.DOMAIN.com` attributed to it.

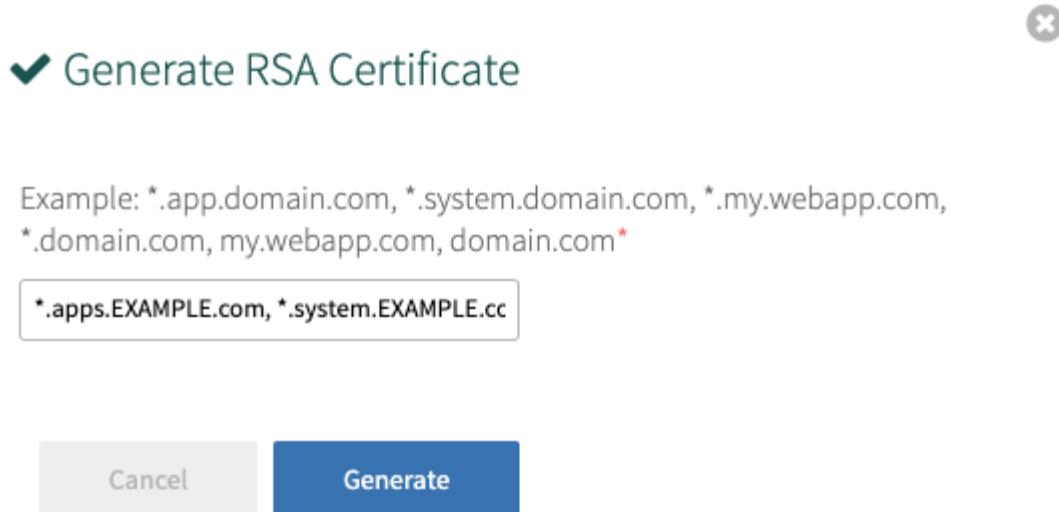
## Generate an RSA certificate in TAS for VMs

To generate an RSA certificate in TAS for VMs:

1. Go to the VMware Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Networking**.
4. Under **Certificate and private keys for the Gorouter**:
  1. Under **Certificate and private key**, click **Change**.
  2. Click **Generate RSA Certificate** to populate the **Certificate and private key** fields with RSA certificate and private key information.

VMware recommends using a split domain configuration that separates the domains for `apps` and `sys` components. To use a split domain configuration, enter the following domains for the certificate, where `DOMAIN` is your registered wildcard domain: \* \*.DOMAIN.com \* \*.apps.DOMAIN.com \* \*.sys.DOMAIN.com \* \*.login.sys.DOMAIN.com \* \*.uaa.sys.DOMAIN.com

5. Click **Generate**.



## Trusted system certificates

As a Operations Manager admin, you can deploy a set of trusted system certificates. These trusted certificates are available in Linux-based app instances running on the Diego back end. Such instances include buildpack-based apps using the `cflinuxfs[3|4]` stack and Docker image-based apps.

If the admin configures these certificates, they are available inside the instance containers as files with extension `.crt` in the read-only `/etc/cf-system-certificates` directory.

For `cflinuxfs[3|4]`-based apps, these certificates are also installed directly in the `/etc/ssl/certs` directory, and are available to libraries such as `openssl` that respect that trust store. If the administrator configure these certificates, the location of the certificates is provided in the environment variable `CF_SYSTEM_CERT_PATH` on the instance container.

## Bulletin Board System (BBS) data store encryption

You must configure Diego Release with a set of encryption keys to encrypt data in the BBS data store. Learn how to configure and rotate encryption keys.

The BBS Data Store encrypts all stored data. Diego automatically encrypts or re-encrypts all of the stored data using the active key on boot. This ensures you can rotate out a key without manually rewriting all of the records.

## Configuring encryption keys

Diego uses multiple keys for decryption while allowing only one for encryption.

To configure encryption, set the `diego.bbs.encryption_keys` and `diego.bbs.active_key_label` properties.

Replace the placeholders in the following manifest with values appropriate for your deployment.

```
properties:
  diego:
    bbs:
      active_key_label: KEY-LABEL-NAME
      encryption_keys:
        - label: 'KEY-LABEL-NAME'
          passphrase: 'MY-PASSPHRASE'
```

In the following example, you configure two encryption keys and select one of them to be the active key. The active key is used for encryption while all configured keys are used for decryption.

```
properties:
  diego:
    bbs:
      active_key_label: key-2017-10
      encryption_keys:
        - label: 'key-2017-10'
          passphrase: 'my september passphrase'
        - label: 'key-2017-09'
          passphrase: 'my august passphrase'
```

## Key label restrictions

Key labels have the following restrictions:

- 127 character limit
- Must not include a `:` (colon) character

Passphrases have no enforced character limit.

## Rotating encryption keys

You can rotate encryption keys without downtime by following a two-deployment procedure. All the records are re-encrypted with the new active key, using the old key for only decryption. After the decryption is successful, you can remove the old key.

The following example rotates `key-2017-09` to `key-2017-10`.

Given the following starting manifest, use this procedure to rotate your encryption keys:

```
properties:
  diego:
    bbs:
      active\key\_label: key-2017-09
      encryption_keys:
        - label: 'key-2017-09'
          passphrase: 'my september passphrase'
```

1. Add the new encryption key `key-2017-10` and set it as the active key.

```

properties:
  diego:
    bbs:
      active\_key\_label: key-2017-10
      encryption_keys:
        - label: 'key-2017-09'
          passphrase: 'my september passphrase'
        - label: 'key-2017-10'
          passphrase: 'my october passphrase'

```

2. Redeploy Diego release.
3. If the first deployment is successful, update the manifest to remove the old key `key-2017-09`.

```

properties:
  diego:
    bbs:
      active\_key\_label: key-2017-10
      encryption_keys:
        - label: 'key-2017-10'
          passphrase: 'my october passphrase'

```

4. Redeploy the Diego release.

After the second deployment is complete, the encryption keys are rotated.

You must complete the second deployment to remove the old key. If not removed, you can continue to decrypt information from the BBS data store using the old key.

## CredHub

In this section:

- [CredHub credential types](#)
- [Backing up and restoring CredHub instances](#)
- [Using hardware security modules with CredHub](#)
- [Using a key management service with CredHub](#)
- [Setting up and deploying CredHub with BOSH](#)
- [Troubleshooting CredHub](#)

## CredHub credential types

There are different credential types that are supported by CredHub.

You can use these credentials to simplify generating and managing multi-part credentials. For example, a TLS certificate contains three parts: the root certificate authority (CA), the certificate, and the private key. CredHub supports all these parts, which helps keep connection requests from being rejected erroneously.

CredHub supports the following credential types:

Type	Description
value	A single string value for arbitrary configurations and other non-generated or validated strings.
json	An arbitrary JSON object for static configurations with many values.
user	Three string values for username, password, and password hash.
password	A single string value for passwords and other random string credentials. Values for this type can be automatically generated.
certificate	An object containing a root CA, certificate, and private key. Use this type for key pair apps that utilize a certificate, such as TLS connections. Values for this type can be automatically generated.
rsa	An object containing an RSA public key and private key without a certificate. Values for this type can be automatically generated.
ssh	An object containing an SSH-formatted public key and private key. Values for this type can be automatically generated.

Each credential type supports distinct parameters for customizing how credentials are generated.

These include minimum password lengths, required characters, and certificate fields.

Credentials have a maximum size of 64 KB. For more information, see [CredHub API documentation](#).

For every credential type, secret values are encrypted before storage. For example, the private key of a certificate type credential and the password of a user type credential are encrypted before storage. For JSON and value type credentials, the full contents are encrypted before storage.

## Backing Up and Restoring CredHub Instances

In VMware Tanzu Application Service for VMs, you can back up CredHub and the data with BOSH Backup and Restore (BBR). For more information, see *Backing Up and Restoring Deployments* in the CredHub documentation.

Ensure you also back up your encryption key. If you do not back up your encryption key, you cannot restore your BBR backups. For more information, see [Backing up the encryption keys](#).

## Using hardware security modules with CredHub

You can configure [AWS CloudHSM](#) devices to work with CredHub.



If you use a [Luna SafeNet HSM](#), rather than AWS, skip over the device allocation portion of the documentation, and start with [Initialize and Configure New HSMs](#).

If you store critical data in CredHub, configuring at least two Hardware Security Modules (HSMs) replicates your keys and provides redundancy and security in the event of an HSM failure. With a single HSM, device failure renders your CredHub data inaccessible.

## Preparation checklist

As you follow these procedures, you can collect or create these resources:

- The name of your encryption key.

- Your HSM certificate.
- Your HSM partition name and password.
- Your client certificate and private key.
- Your HSM partition serial numbers.

## Creating new AWS CloudHSMs

The following sections tell you how to create new AWS CloudHSMs:

### AWS environment prerequisites



For high availability (HA), use at least two HSM instances. AWS documentation recommends that you also use a subnet for a publicly available Control Instance, but for this product that is unnecessary. CredHub acts as a Control Instance.

Before you create new AWS CloudHSMs, you must have:

- A Virtual Private Cloud (VPC).
- **For each HSM instance:** One private subnet in its own Availability Zone (AZ).
- An IAM role for the HSM with a policy equivalent to [AWScloudHSMRole](#) policy.
- The Security Group must allow traffic from the CredHub security group on ports 22 (SSH) and 1792 (HSM).

### Creating new devices

To create new AWS CloudHSMs:

1. Install the AWS CLI from [AWS CloudHSM Command Line Tools](#) in the AWS documentation.
2. Create SSH key pairs for all planned HSMs by running:

```
ssh-keygen -b 4096 -t rsa -N PASSWORD -f PATH-TO-SSH-KEY.pem
```

Where:

- **PASSWORD** is the password you create for the SSH key.
- **PATH-TO-SSH-KEY** is the filepath of your SSH key PEM file.

3. Create the `cloudhsm.conf` file with these values:

```
aws_access_key_id=ACCESS-KEY-ID
aws_secret_access_key=SECRET-ACCESS-KEY
aws_region=AWS-REGION
```

Where:

- **ACCESS-KEY-ID** is your AWS access key ID.
- **SECRET-ACCESS-KEY** is your AWS secret access key.

- `AWS-REGION` is your AWS region.

4. To create each HSM and place it in the appropriate subnet, run:

```
cloudhsm create-hsm \
--conf_file PATH-TO-CLOUDHSM.conf \
--subnet-id SUBNET-ID \
--ssh-public-key-file PATH-TO-SSH-KEY.pem.pub \
--iam-role-arn IAM-HSN-ROLE-ARN
```

Where:

- `PATH-TO-CLOUDHSM` is the filepath to your `cloudhsm.conf` file.
- `SUBNET-ID` is the ID of the subnet in which you want to place your HSM.
- `PATH-TO-SSH-KEY` is the filepath to your public SSH key PEM key.
- `IAM-HSN-ROLE-ARN` is the Amazon Resource Name (ARN) of your HSM's IAM role. For more information, see [IAM ARNs](#) in [IAM Identifiers](#) in the AWS documentation.

5. Assign the security group to each HSM:

1. Retrieve the Elastic Network Interface ID `EniID` of the HSM by running:

```
cloudhsm describe-hsm -H HSM-ARN -r AWS-REGION
```

Where:

- `HSM-ARN` is the ARN of your HSM.
- `AWS-REGION` is the AWS region of your HSM.

2. Edit the network interface to assign the security group by running:

```
aws ec2 modify-network-interface-attribute \
--network-interface-id ENI-ID \
--groups SECURITY-GROUP-ID
```

Where:

- `ENI-ID` is the `EniID` you retrieved in the previous step.
- `SECURITY-GROUP-ID` is the ID of the security group you want to assign to this HSM.

## Initializing and configuring new HSMs

The following sections describe the steps to initialize and configure your HSMs, whether they are Luna HSMs or AWS CloudHSMs. You must follow this procedure for each HSM you created.

### SSH onto HSM

To SSH onto HSM you want to initialize and configure using these steps:

1. Retrieve the IP address of your HSM by running:

```
cloudhsm describe-hsm -H HSM-ARN -r AWS-REGION
```

Where:

- **HSM-ARN** is the ARN of your HSM.
- **AWS-REGION** is the AWS region of your HSM.

2. SSH onto the HSM by running:

```
ssh -i path/to/ssh-key.pem manager@HSM-IP
```

Where **HSM-IP** is the IP address you retrieved in the previous step.

## Initializing and setting policies

To initialize your HSM and set its' policies:

1. Initialize the HSM and create an admin password when you are prompted by running:

```
lunash:> hsm init -label LABEL

Where `LABEL` is the label you want to give the HSM.
<br>
<br>
Initialize all HSMs into the same cloning domain to guarantee high availability
for your Operations Manager deployment.
```

2. Log in to the HSM using the password you just created by running:

```
lunash:> hsm login
```

3. Confirm that only FIPS algorithms are enabled. Run:

```
lunash:> hsm changePolicy -policy 12 -value 0
```

4. To confirm that **Allow cloning** and **Allow network replication** policy values are set to **On** on the HSM, run:

```
hsm showPolicies
```

If these values are not set to **On**, change them by running:

```
lunash:> hsm changePolicy -policy POLICY-CODE -value 1
```

Where **POLICY-CODE** is the numerical code of the **Allow cloning** or **Allow network replication** policy.

5. Validate that the **SO can reset partition PIN** is correctly set. If it's set to **Off**, consecutive failed log in attempts permanently erase the partition once the failure count hits the configured threshold. If it's set to **On**, the partition locks once the threshold is met. An HSM admin must unlock the partition, but no data is lost.

To set the policy to `On`, run:

```
lunash:> hsm changePolicy -policy 15 -value 1
```

## Retrieving the HSM certificate

To retrieve your HSM certificate:

1. Run:

```
scp -i path/to/ssh-key.pem \
manager@HSM-IP-ADDRESS:server.pem \
HSM-IP-ADDRESS.pem
```

Where `HSM-IP-ADDRESS` is the IP address of your HSM.

BOSH CredHub uses this certificate to validate the identity of the HSM when it connects to it.

## Creating the HSM partition

To create an HSM partition to hold the encryption keys:

1. Run:

```
lunash:> partition create -partition PARTITION-NAME -domain CLONING-DOMAIN
```

Where:

- `PARTITION-NAME` is the name you give the partition.
- `CLONING-DOMAIN` is the cloning domain of the HSM.

2. Create a password for the partition. The partition password must be the same for all partitions in the highly available partition group.
3. To retrieve the partition serial number, run:

```
lunash:> partition show -partition PARTITION-NAME
```

Where `PARTITION-NAME` is the name of the partition you created.

4. Record the `Partition SN` shown in the output of the command you ran in the previous step.

## Creating and registering HSM clients

Clients that communicate with the HSM must provide a client certificate to establish a client authenticated session. You must set up each client certificate on the HSM and assign access rights for your partition.

## Establishing a network trust link between client and HSMs

To establish a network trust link between a client and your HSMs:

1. Create a certificate for the client by running:

```
openssl req \
-x509 \
-newkey rsa:4096 \
-days NUMBER-OF-DAYS \
-sha256 \
-nodes \
-subj "/CN=CLIENT-HOSTNAME-OR-IP" \
-keyout CLIENT-HOSTNAME-OR-IP.pem \
-out CLIENT-HOSTNAME-OR-IP.pem
```

Where:

- NUMBER-OF-DAYS is the number of days you want the network trust link to be valid.
- CLIENT-HOSTNAME-OR-IP is the hostname or IP address of the client.

2. Copy the client certificate to your HSM by running:

```
scp -i path/to/ssh-key.pem \
CLIENT-HOSTNAME-OR-IP.pem \
manager@HSM-IP:CLIENT-HOSTNAME-OR-IP.pem
```

Where CLIENT-HOSTNAME-OR-IP is the hostname or IP address of the client.

## Registering HSM client host and partitions

To register a client host and partitions for your HSM:

1. Create a client by running:

```
lunash:> client register -client CLIENT-NAME -hostname CLIENT-HOSTNAME
```

Where:

- CLIENT-NAME is the name of the client.
- CLIENT-HOSTNAME is the hostname of your planned CredHub instances.

2. (Optional) If you are only planning to run one CredHub instance, you can also register a client with the planned CredHub IP address by running:

```
lunash:> client register -client CLIENT-NAME -ip CLIENT-IP-ADDRESS
```

Where:

- CLIENT-NAME is the name of the client.
- CLIENT-IP-ADDRESS is the IP address of your planned CredHub instance.

3. Assign the partition that you created in the previous section to the client by running:

```
lunash:> client assignPartition -client CLIENT-NAME -partition PARTITION-NAME
```

Where:

- CLIENT-NAME is the name of the client.
- PARTITION-NAME is the name of the partition you created.

## Setting HSM encryption keys

You can set which key is used for encryption operations by defining the encryption key name in the deployment manifest file. By default, a key that exists on the HSM is used for encryption operations. If a key does not exist on the HSM, CredHub creates it automatically in the referenced partition.

When you generate a new key, review the list of keys on each HSM to validate that key replication is occurring. If new keys do not propagate among the HSMs, you can get locked out of the HSMs.

To review stored keys on a partition:

1. Run:

```
lunash:> partition showContents -partition PARTITION-NAME
```

Where `PARTITION-NAME` is the name of the partition on which your keys are stored.

## Getting ready for deployment

Now you can deploy CredHub with your new HSMs.

Edit your manifest file as shown here:

```
credhub:
  properties:
    encryption:
      keys:
        - provider_name: primary
          encryption_key_name: ENCRYPTION-KEY-NAME
          active: true
      providers:
        - name: primary
          type: hsm
          partition: PARTITION-NAME
          partition_password: PARTITION-PASSWORD
          client_certificate: CLIENT-CERTIFICATE
          client_key: CLIENT-PRIVATE-KEY
          servers:
            - host: 10.0.0.1
              port: 1792
              certificate: HSM-CERTIFICATE
              partition_serial_number: PARTITION-SERIAL-NUMBER
            - host: 10.0.0.10
              port: 1792
              certificate: HSM-CERTIFICATE
              partition_serial_number: PARTITION-SERIAL-NUMBER
```

Where:

- `ENCRYPTION-KEY-NAME` is the encryption key you set in [Setting HSM encryption keys](#).
- `PARTITION-NAME` is the name of the partition you created in [Creating the HSM partition](#).
- `PARTITION-PASSWORD` is the password of the partition you created in [Creating the HSM Partition](#).
- `CLIENT-CERTIFICATE` is the client certificate you created in [Establishing a network trust link between client and HSMs](#).

- **CLIENT-PRIVATE-KEY** is the private key you created in [Establishing a network trust link between client and HSMs](#).
- **HSM-CERTIFICATE** is one of the HSM certificates you retrieved in [Retrieving the HSM certificate](#).
- **PARTITION-SERIAL-NUMBER** is the partition serial number you retrieved in [Creating the HSM partition](#).

## Renewing or rotating a client certificate

The generated client certificate has a fixed expiration date. After expiration the HSM no longer accepts it.

To rotate or renew this certificate at any time:

1. Generate a new certificate for the client by running:

```
openssl req \
-x509 \
-newkey rsa:4096 \
-days NUMBER-OF-DAYS \
-sha256 \
-nodes \
-subj "/CN=CLIENT-HOSTNAME-OR-IP" \
-keyout CLIENT-HOSTNAME-OR-IPKey.pem \
-out CLIENT-HOSTNAME-OR-IP.pem
```

Where:

- **NUMBER-OF-DAYS** is the number of days you want the network trust link to be valid.
- **CLIENT-HOSTNAME-OR-IP** is the hostname or IP address of the client.

2. Copy the client certificate to each HSM by running:

```
scp -i path/to/ssh-key.pem \
CLIENT-HOSTNAME-OR-IP.pem \
manager@HSM-IP:CLIENT-HOSTNAME-OR-IP.pem
```

Where **CLIENT-HOSTNAME-OR-IP** is the hostname or IP address of the client.

3. (Optional) Review the client's partition assignments by running:

```
lunash:> client show -client CLIENT-NAME
```

Where **CLIENT-NAME** is the name of the client.

4. Remove the existing client by running:

```
lunash:> client delete -client CLIENT-NAME
```

Where **CLIENT-NAME** is the name of the client.



When you remove the existing client, all partition assignments are deleted.

5. Register the client again by running:

```
lunash:> client register -client CLIENT-NAME -ip CLIENT-IP
```

Where:

- `CLIENT-NAME` is the name of the client.
- `CLIENT-IP` is the IP address of the client.

#### 6. Assign the partition assignments again by running:

```
lunash:> client assignPartition -client CLIENT-NAME -partition PARTITION-NAME
```

Where:

- `CLIENT-NAME` is the name of the client.
- `PARTITION-NAME` is the name of the partition to which the client is assigned.

#### 7. (Optional) Validate the new certificate fingerprint by running:

```
lunash:> client fingerprint -client CLIENT-NAME
```

Where `CLIENT-NAME` is the name of the client.

If you need to, you can compare the fingerprint to your locally stored certificate by running:

```
openssl x509 -in clientcert.pem -outform DER | md5sum
```

## Using a key management service with CredHub

You can connect CredHub to a third party Key Management Service (KMS) using Kubernetes API.

CredHub includes its' own internal encryption. However, you might want to use the encryption provided by a KMS instead.

To use a KMS, you must deploy a plug-in with CredHub. CredHub is compatible with plug-ins that implement the KMS provider interface that is defined in the [protobuf](#) format. For more information, see [Using a KMS provider for data encryption](#) in the Kubernetes documentation.

The KMS interface comes from Kubernetes, but it's not necessary to use Kubernetes when you write a plug-in. For more information, see [Language Guide \(proto3\)](#) in the Google Protocol Buffers documentation.

Any plug-in that implements the KMS provider interface can be compatible with CredHub. Consult the documentation for your KMS provider to learn if a plug-in exists.

- If a plug-in exists for your KMS provider, see [Building a BOSH release](#).
- If a plug-in has not been created for your KMS provider, see [Implementing the plug-in](#).

## Implementing the plug-in

You can implement the KeyManagementService interface in any language. The following example is written in Go. For more information about the KeyManagementService interface, see the [sample-credhub-kms-plugin](#) repository on GitHub.

You must implement the following methods:

```
// This service defines the public APIs for remote KMS provider.
service KeyManagementService {
    // Version returns the runtime name and runtime version of the KMS provider.
    rpc Version(VersionRequest) returns (VersionResponse) {}

    // Execute decryption operation in KMS provider.
    rpc Decrypt(DecryptRequest) returns (DecryptResponse) {}

    // Execute encryption operation in KMS provider.
    rpc Encrypt(EncryptRequest) returns (EncryptResponse) {}
}
```

For sample plug-ins, see:

- [Plug-in](#) that uses Base64 encoding for encryption in the [sample-credhub-kms-plugin](#) GitHub repository
- [Plug-in](#) that connects to a fake KMS in the [kubernetes](#) GitHub repository

## Building a BOSH release

Because CredHub is deployed using BOSH, you must deploy the plug-in as a BOSH release on the same instance group as CredHub.

To create a BOSH release for your plug-in, see [Creating a release](#) in the BOSH documentation.

Your BOSH release must run the plug-in with a defined socket. You must reference this socket in your CredHub BOSH manifest.

For an example of a BOSH release of a CredHub KMS plug-in with a defined socket, see the [sample-credhub-kms-plugin-release](#) repository on GitHub.

## Build and install a tile

To use the KMS plug-in with CredHub deployed with Tanzu Operations Manager or VMware Tanzu Application Service for VMs (TAS for VMs), you must wrap your BOSH release in a tile and install it on the Tanzu Operations Manager Installation Dashboard.

To build and install a tile:

1. Install the Tile Generator by doing one of these steps:
  - Download the Tile Generator binary for your platform from the [Operations Manager Tile Generator](#) repository on GitHub, then make it executable and available by running:

```
chmod +x TILE-BINARY
mv TILE-BINARY /usr/local/bin/tile
```

Where: `TILE-BINARY` is the name of the tile binary file.

- Use Python 2 and [Virtualenv](#). VMware recommends that you use a `virtualenv` environment to avoid conflicts with other Python packages. A `virtualenv` is a directory containing dependencies for a project. When a virtual environment is active, packages

install into the `virtualenv` instead of the system-wide Python installation.

To use this method, run:

```
virtualenv -p python2 tile-generator-env
source tile-generator-env/bin/activate
pip install tile-generator
```

This puts the `tile` and `pcf` commands in your `PATH` when the `virtualenv` is active. To deactivate the `virtualenv`, run the command `deactivate`. To upgrade Tile Generator, run `pip install tile-generator --upgrade` with the `virtualenv` activated.

2. Install the BOSH CLI. For more information, see [Installing the CLI](#) in the BOSH documentation.
3. From within the root directory of the project for which you want to create a tile, initialize the directory as a tile repository by running:

```
tile init
```

This command generates a `tile.yml` file. This file defines the configuration for your tile.

4. Modify the `tile.yml` as needed. At a minimum, you must enter the path to the BOSH release of the KMS plug-in on your local machine in `packages: path`. The example `tile.yml` file below defines a tile named `Sample CredHub KMS Plugin` that enables the operator to configure the socket endpoint where the plugin listen for CredHub:

```
---
name: sample-credhub-kms-plugin-tile
icon_file: icon.png
label: Sample CredHub KMS Plugin
description: Sample CredHub KMS Plugin

packages:
- name: my-release-name
  type: bosh-release
  path: releases/MY-BOSH-RELEASE.tgz

forms:
- name: plugin-properties
  label: Plugin Properties
  description: Configure your plugin
  properties:
  - name: socket_endpoint
    type: string
    label: Socket Endpoint

runtime_configs:
- name: some-runtime-config
  runtime_config:
    releases:
    - name: my-release-name
      version: "my-release-version"
    addons:
    - name: some-addon-name
      jobs:
      - name: my-job-name
```

```

release: my-release-name
properties:
  socket_endpoint: (( .properties.socket_endpoint ))
include:
jobs:
- name: credhub
  release: credhub

```

For general information about writing the `tile.yml` file, see [Define your tile in tile.yml](#) in *Tile Generator* in the Operations Manager Tile Developer Guide. For information about enabling operators to use the tile to configure arbitrary properties in the manifest, see [Custom forms and properties](#) in *Tile Generator* in the Operations Manager Tile Developer Guide.

5. In the directory that contains the `tile.yml` file, build the tile by running:

```
tile build
```

The tile generator wraps the BOSH release of the KMS plug-in into a tile, then places the tile file in the `product` subdirectory.

6. Go to Tanzu Operations Manager, log in, and add the tile to the Tanzu Operations Manager Installation Dashboard. For more information, see [Adding and deleting products](#).
7. Click the tile and complete the configuration.
8. Return to the Tanzu Operations Manager Installation Dashboard. Click **Review Pending Changes** > **Apply Changes** to complete the installation.

## Setting up and deploying CredHub with BOSH

The BOSH Director and VMware Tanzu Platform for Cloud Foundry tiles deploy CredHub instances as part of the installation process. For more information, see [Installing Operations Manager](#).

## Troubleshooting CredHub

You can resolve errors that might occur when you deploy, upgrade, or interact with CredHub.

## Deployment failures

CredHub deployment failures include:

- Configuration errors
- Pre-start errors
- Post-start errors

For additional information about troubleshooting CredHub deployment failures, see [Error list in Troubleshooting Guide](#) in the CredHub repository on GitHub.

## Configuration errors

Configuration errors occur before CredHub deploys.

For example:

```
Using deployment 'credhub'
```

Evaluating manifest:

```
yaml: line 63: could not find expected ':'
```

```
Exit code 1
```

Configuration errors start with `yaml` and occur before the BOSH task is created. They indicate an error in parsing your manifest.

To correct a configuration error, review the structure of your manifest at the line specified in the error message to ensure the format and indentation are valid.

Additionally, you might see the following error format:

Task 474

```
18:20:35 | Preparing deployment: Preparing deployment (00:00:13)
```

```
18:20:52 | Error: Unable to render instance groups for deployment. Errors are:
```

- Unable to render jobs for instance group 'credhub'. Errors are:
  - Unable to render templates for job 'credhub'. Errors are:
    - Error filling in template 'application.yml.erb' (line 22: Can't find property '["credhub.data\_storage.type"]')

```
Started Thu Jan 26 18:20:35 UTC 2019
```

```
Finished Thu Jan 26 18:20:52 UTC 2019
```

```
Duration 00:00:17
```

Task 474 error

Updating deployment:

```
Expected task '474' to succeed but was state is 'error'
```

```
Exit code 1
```

This error occurs when a required field is not defined in the manifest. In the previous example, the following configuration value is missing:

```
Can't find property '["credhub.data_storage.type"]'
```

Missing or invalid values might cause another similar error:

Task 697

```
21:27:55 | Preparing deployment: Preparing deployment (00:00:14)
```

```
21:28:13 | Error: Unable to render instance groups for deployment. Errors are:
```

- Unable to render jobs for instance group 'credhub'. Errors are:

```
- Unable to render templates for job 'credhub'. Errors are:
  - Error filling in template 'pre-start.erb' (line 15: undefined method
    '[]' for nil:NilClass)
```

Started Thu Jan 26 21:27:55 UTC 2019  
 Finished Thu Jan 26 21:28:13 UTC 2019  
 Duration 00:00:18

Task 697 error

Updating deployment:  
 Expected task '697' to succeed but was state is 'error'

Exit code 1

When you are troubleshooting this error, use the line number and the template specified in the error message to identify the missing or invalid value.

## Pre-start errors

Pre-start errors occur when CredHub is unable to perform pre-start tasks. For example:

Task 789

```
22:34:08 | Preparing deployment: Preparing deployment (00:00:14)
22:34:26 | Preparing package compilation: Finding packages to compile (00:00:
02)
22:34:28 | Updating instance dan-credhub: credhub/0261faa8-f5f4-4f6e-8ebe-3cf
cba3f7190 (0) (canary) (00:00:18)
      L Error: Action Failed get_task: Task c69563a2-51e7-4b10-5c64-bb0
84ef85863 result: 1 of 1 pre-start scripts failed. Failed Jobs: credhub.

22:34:46 | Error: Action Failed get_task: Task c69563a2-51e7-4b10-5c64-bb084e
f85863 result: 1 of 1 pre-start scripts failed. Failed Jobs: credhub.
```

Started Thu Jan 26 22:34:08 UTC 2019  
 Finished Thu Jan 26 22:34:46 UTC 2019  
 Duration 00:00:38

Task 789 error

Updating deployment:  
 Expected task '789' to succeed but was state is 'error'

Exit code 1

## Accessing logs

CredHub stores pre-start logs in the `/var/vcap/sys/log/credhub/pre-start.stderr.log` and `pre-
start.stdout.log` files.

To access these logs when you are troubleshooting a pre-start error, you must SSH into the CredHub VM or SCP the logs from it.

## Post-start errors

Post-start errors occur when a post-start script fails. For example:

```
Task 478
```

```
20:03:32 | Preparing deployment: Preparing deployment (00:00:13)
20:03:49 | Preparing package compilation: Finding packages to compile (00:00:
02)
20:03:52 | Updating instance credhub: credhub/0261faa8-f5f4-4f6e-8ebe-3cfcba3
f7190 (0) (canary) (00:02:34)
    L Error: Action Failed get_task: Task 5fe7ac60-4ccc-4bda-4ccb-6e8
8908597ef result: 1 of 1 post-start scripts failed. Failed Jobs: credhub.
```

```
20:06:27 | Error: Action Failed get_task: Task 5fe7ac60-4ccc-4bda-4ccb-6e8890
8597ef result: 1 of 1 post-start scripts failed. Failed Jobs: credhub.
```

```
Started Thu Jan 26 20:03:32 UTC 2019
Finished Thu Jan 26 20:06:27 UTC 2019
Duration 00:02:55
```

```
Task 478 error
```

```
Updating deployment:
  Expected task '478' to succeed but was state is 'error'
```

```
Exit code 1
```

## Accessing logs

The CredHub log is stored in the `/var/vcap/sys/log/credhub/credhub.log` file.

To access these logs when you are troubleshooting a post-start error, you must SSH into the CredHub VM or SCP the logs from it.

The CredHub log is written according to the `log_level` variable, specified in your manifest.

To locate the cause of the failure, search for `ERROR` in the logs. Because Monit attempts to restart a failing CredHub process, you might see multiple instances of the same error.

Additionally, you can review other log files in the `/var/vcap/sys/log/credhub` directory.

## Usability failures

Usability failures occur after a successful deployment of CredHub. If you receive an internal server error without a descriptive error message, review the CredHub log as described in [Accessing logs](#).

For additional information about troubleshooting usability failures, see [Error List](#) in *Troubleshooting Guide* in the CredHub repository on GitHub.

# Component Communications

In this section:

- [BOSH DNS network communications](#)
- [Cloud Controller network communications](#)
- [Container-to-container network communications](#)
- [CredHub network communications](#)
- [Diego network communications](#)
- [Loggregator network communications](#)
- [MySQL network communications](#)
- [NATS network communications](#)
- [Routing network communications](#)
- [UAA network communications](#)

## BOSH DNS network communications

In this topic, you can learn about BOSH DNS internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about BOSH DNS, see [Native DNS Support](#) in the BOSH documentation.

The following table lists network communication paths for BOSH DNS.

Port 8853 is the destination port for communications between BOSH DNS health processes. You must allow TCP traffic on 8853 for all VMs running BOSH DNS.

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
Any VM running BOSH DNS	backup_restore	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	clock_global	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	cloud_controller	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	cloud_controller_worker	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	credhub	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	diego_brain	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	diego_cell	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
Any VM running BOSH DNS	diego_database	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	doppler	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	ha_proxy	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	log_cache	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	loggregator_trafficcontroller	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	mysql	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	mysql_monitor*	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	mysql_proxy*	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	nats	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	nfs_server†	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	router	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	tcp_router	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	uaa	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	Service instance VMs	53	TCP and UDP	DNS	Unencrypted. This communication happens inside the VM.
Any VM running BOSH DNS	backup_restore	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	clock_global	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	cloud_controller	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	cloud_controller_worker	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	credhub	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	diego_brain	885 3	TCP	HTTPS	Mutual TLS

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
Any VM running BOSH DNS	diego_cell	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	diego_database	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	doppler	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	ha_proxy	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	log_cache	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	loggregator_trafficcontroller	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	mysql	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	mysql_monitor*	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	mysql_proxy*	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	nats	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	nfs_server†	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	router	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	tcp_router	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	uaa	885 3	TCP	HTTPS	Mutual TLS
Any VM running BOSH DNS	Service instance VMs	885 3	TCP	HTTPS	Mutual TLS

\*Applies only to deployments where internal MySQL is selected as the database.

†Applies only to deployments where the internal NFS server is selected for file storage.

## Cloud Controller network communications

The tables here show Cloud Controller internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about Cloud Controller, see [Cloud Controller](#).

## Inbound communications

The following table lists network communication paths that are inbound to the Cloud Controller:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller	cloud_controller (Routing API)	443	TCP	HTTPS	OAuth 2.0
clock_global (Syslog Binding Cache)	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
diego_brain	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
diego_brain (SSH Proxy)	cloud_controller	902 4	TCP	HTTPS	OAuth 2.0
diego_cell (Rep)	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
diego_database (BBS)	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
log_cache (Log Cache CF Auth Proxy)	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
loggregator_trafficcontroller (Traffic Controller)	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
loggregator_trafficcontroller (Reverse Log Proxy)	cloud_controller	902 3	TCP	HTTPS	Mutual TLS
router	cloud_controller	902 4	TCP	HTTPS	OAuth 2.0

## Outbound communications

The following table lists network communication paths that are outbound from the Cloud Controller:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller	mysql_proxy*	330 6	TCP	MySQL	MySQL authentication**
cloud_controller	nfs_server or other blobstore†	444 3	TCP	HTTPS	TLS and basic authentication
cloud_controller	uaa	844 3	TCP	HTTPS	OAuth 2.0 or none
cloud_controller	diego_database (BBS)	888 9	TCP	HTTPS	Mutual TLS
cloud_controller (Route Registrar)	nats	422 2	TCP	NATS	Basic authentication

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller (Routing API)	diego_database (Locket)	889 1	TCP	HTTPS	Mutual TLS
cloud_controller_worker	mysql_proxy*	330 6	TCP	MySQL	MySQL authentication**
cloud_controller_worker	nfs_server or other blobstore†	444 3	TCP	HTTPS	TLS and basic authentication
clock_global	mysql_proxy*	330 6	TCP	MySQL	MySQL authentication**

\*Applies only to deployments where internal MySQL is selected as the database.

\*\*MySQL authentication uses the MySQL native password method.

†The destination depends on your file storage or blobstore configuration.

The authentication method depends on the type of request.

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## Container-to-container network communications

The tables here show the network communication paths to container-to-container networking in VMware Tanzu Application Service for VMs (TAS for VMs).

For more information about container-to-container networking, see [Container-to-container networking](#).

## Inbound communications

The following table lists network communication paths that are inbound to container-to-container networking.

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
diego_cell (Silk CNI)	diego_cell (Silk Daemon)	2395 4	TCP	HTTP	None
diego_cell (Silk Daemon)	diego_api (Silk Controller)	4103	TCP	HTTP	Mutual TLS
diego_cell (VXLAN Policy Agent)	diego_database (api - Policy Server Internal)	4003	TCP	HTTP	Mutual TLS
diego_cell (BOSH DNS Adapter)	diego_brain (Service Discovery Controller)	8054	TCP	HTTP	Mutual TLS

## Outbound communications

The following table lists network communication paths that are outbound from container-to-container networking:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
diego_database (API - Policy Server)	uaa	844 3	TCP	HTTPS	TLS
diego_database (API - Policy Server)	cloud_controller (api - Cloud Controller)	902 2	TCP	HTTP	OAuth 2.0
diego_database (API - Policy Server)	mysql_proxy*	330 6	TCP	MySQL	MySQL authentication
diego_brain (Service Discovery Controller)	nats (NATS)	422 2	TCP	HTTP	Basic authentication
diego_cell (BOSH DNS)	diego_cell (BOSH DNS Adapter)	805 3	TCP	HTTP	None
diego_cell (VXLAN Policy Agent)	mysql_proxy*	330 6	TCP	MySQL	MySQL authentication

\*Applies only to deployments where internal MySQL is selected as the database.

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## CredHub network communications

This topic describes CredHub internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about CredHub, see [CredHub](#).

## Inbound Communications

The following table lists network communication paths that are inbound to CredHub:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller (API)	credhub	884 4	TCP	HTTPS	OAuth 2.0
diego_cell	credhub	884 4	TCP	HTTPS	Mutual TLS†
windows_cell	credhub	884 4	TCP	HTTPS	Mutual TLS†

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
windows2016_cell	credhub	8844 4	TCP	HTTPS	Mutual TLS†

†Diego Cells use the certificate pairs generated for individual containers to authenticate with CredHub on behalf of apps.

## Outbound Communications

The following table lists network communication paths that are outbound from CredHub:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
credhub	uaa	8443	TCP	HTTPS	N/A
credhub	mysql_proxy*	3306	TCP	MySQL	MySQL authentication**

\*Applies only to deployments where internal MySQL is selected as the database.

\*\*MySQL authentication uses the MySQL native password method.

†Diego Cells use the certificate pairs generated for individual containers to authenticate with CredHub on behalf of apps.

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## Diego network communications

The tables here show Diego internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about Diego components and architecture, see [How Diego pushes an app in Diego Components and Architecture](#).

## Inbound communications

The following table lists network communication paths that are inbound to Diego:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller	diego_database (BBS)	8889 9	TCP	HTTPS	Mutual TLS
cloud_controller (Routing API)	diego_database (Locket)	8891	TCP	HTTPS	Mutual TLS

## Diego internal communications

The following table lists network communication paths that are internal for Diego:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
diego_brain (Auctioneer)	diego_cell (Rep)	1801	TCP	HTTPS	Mutual TLS
diego_brain (Auctioneer)	diego_database (BBS)	8889	TCP	HTTPS	Mutual TLS
diego_brain (Auctioneer)	diego_database (Locket)	8891	TCP	HTTPS	Mutual TLS
diego_brain (SSH Proxy)	diego_database (BBS)	8889	TCP	HTTPS	Mutual TLS
diego_brain (SSH Proxy)	diego_cell (App instances)	Varies ‡	TCP	SSH	SSH
diego_brain (TPS Watcher)	diego_database (Locket)	8891	TCP	HTTPS	Mutual TLS
diego_cell (local Route Emitter)	diego_database (BBS)	8889	TCP	HTTPS	Mutual TLS
diego_cell (Rep)	diego_brain (CC Uploader)	9091	TCP	HTTPS	Mutual TLS
diego_cell (Rep)	diego_brain (File Server) <sup>**</sup>	8447	TCP	HTTPS	TLS
diego_cell (Rep)	diego_database (BBS)	8889	TCP	HTTPS	Mutual TLS
diego_cell (Rep)	diego_database (Locket)	8891	TCP	HTTPS	Mutual TLS
diego_database (BBS)	diego_brain (Auctioneer)	9016	TCP	HTTPS	Mutual TLS
diego_database (BBS)	diego_cell (Rep)	1801	TCP	HTTPS	Mutual TLS
diego_database (BBS)	diego_database (Locket)	8891	TCP	HTTPS	Mutual TLS

<sup>‡</sup>These are the host-side ports that map to port 2222 in app instance containers and are typically within the range 61001 to 65534.

<sup>\*\*</sup>The Diego File Server is responsible for distributing non-sensitive, static platform assets to internal platform components.

## Outbound communications

The following table lists network communication paths that are outbound from Diego:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
diego_brain	cloud_controller	9023	TCP	HTTPS	Mutual TLS
diego_brain (SSH Proxy)	cloud_controller	9024	TCP	HTTPS	OAuth 2.0
diego_brain (SSH Proxy)	uaa	443	TCP	HTTPS	TLS and OAuth 2.0
diego_cell (local Route Emitter)	nats	4222, 4223, 4224, 4225	TCP	NATS	Basic authentication
diego_cell (Rep)	cloud_controller	9023	TCP	HTTPS	Mutual TLS
diego_cell (Rep)	nfs_server or other blobstore*	Varies	TCP	HTTP	Signed URLs/TLS
diego_database (BBS)	cloud_controller	9023	TCP	HTTPS	Mutual TLS
diego_database (BBS)	mysql_proxy†	3306	TCP	MySQL	MySQL authentication**
diego_database (Locket)	mysql_proxy†	3306	TCP	MySQL	MySQL authentication**

\*The destination depends on your TAS for VMs blobstore configuration. If you use the internal blobstore, the Diego Cell communicates to the blobstore using TLS on port 4443.

\*\*MySQL authentication uses the MySQL native password method.

†Applies only to deployments where internal MySQL is selected as the database.

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## Loggregator network communications

The tables here show Loggregator internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about Loggregator components and architecture, see [Loggregator components and architecture](#).

## Loggregator communications

The following table lists network communication paths for Loggregator:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
Any*	loggregator_trafficcontroller	8081	TCP	HTTP/WebSocket	OAuth
Any VM running Loggregator Agent	doppler	8082	TCP	gRPC over HTTP/2	Mutual TLS
loggregator_trafficcontroller	doppler	8082	TCP	gRPC over HTTP/2	Mutual TLS
loggregator_trafficcontroller	uaa	8443	TCP	HTTPS	TLS
loggregator_trafficcontroller	cloud_controller	9023	TCP	HTTPS	Mutual TLS
loggregator_trafficcontroller (Reverse Log Proxy)	doppler	8082	TCP	gRPC over HTTP/2	Mutual TLS
loggregator_trafficcontroller (Route Registrar)	nats	4222	TCP	NATS	Basic authentication
loggregator_trafficcontroller (Metrics Forwarder)	BOSH Director (Metrics Server)	25555 and 8443	TCP	gRPC over HTTP/2	Mutual TLS
loggregator_trafficcontroller (Reverse Log Proxy Gateway)	log_cache	8080	TCP	gRPC over HTTP/2	Mutual TLS
loggregator_trafficcontroller (Reverse Log Proxy Gateway)	cloud_controller	9023	TCP	HTTPS	Mutual TLS
Any*	loggregator_trafficcontroller (Reverse Log Proxy Gateway)	8088	TCP	HTTP/Server Sent Events	OAuth

\* Any source VM can send requests to the specified destination within its subnet.

\*\* Any host configured through a user-provided service binding with a syslog URL.

\*\*\* Any port configured through a user-provided service binding with syslog URL.

\*\*\*\* Basic authentication only supported for HTTPS syslog drains.

## Log Cache communications

The following table lists network communication paths for Log Cache:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
Any VM running Loggregator Syslog Agent*	log_cache	6067	TCP	Syslog	TLS or Mutual TLS (configurable)

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
Any**	log_cache	8080	TCP	gRPC over HTTP/2	Mutual TLS
log_cache (Nozzle)***	loggregator_trafficcontroller (Reverse Log Proxy)	8082	TCP	gRPC over HTTP/2	Mutual TLS
gorouter	log_cache (Auth Proxy)	8083	TCP	HTTP	OAuth
log_cache (Auth Proxy)	uaa	8443	TCP	HTTPS	TLS
log_cache (Auth Proxy)	cloud_controller	9024	TCP	HTTPS	TLS

\*When Log Cache is configured to use Syslog ingestion.

\*\*Any source VM can send requests to the specified destination within its subnet.

\*\*\*When Log Cache is configured to use Reverse Log Proxy ingestion.

## OpenTelemetry Collector communications

The OpenTelemetry Collector (OTel Collector) sends requests to destinations specified by the operator. Destination hostname, port, protocol, and security settings are configured in the `exporters` section of configuration code entered in the TAS for VMs tile > **System Logging** pane > **OpenTelemetry Collector Configuration** field.

Note that while exporters generally make egress requests to drain destinations, the prometheus exporter in particular will expose an endpoint for an external client to send scrape requests.

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## MySQL network communications

The following tables show MySQL internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

These communications only apply to deployments where internal MySQL is selected as the TAS for VMs database.

## Inbound communications

The following table lists network communication paths that are inbound to MySQL VMs:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
cloud_controller_worker	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
clock_global	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
credhub	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
diego_cell (VXLAN Policy Agent)	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
diego_database (Policy Server)	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
diego_database (BBS)	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
diego_database (Locket)	mysql_proxy	3306	TCP	MySQL	MySQL authentication*
uaa	mysql_proxy	3306	TCP	MySQL	MySQL authentication*

\* MySQL authentication uses the MySQL native password method.

## Internal communications

The following table lists network communication paths that are internal to MySQL VMs:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
mysql	mysql (Galera)	4567	TCP	MySQL	MySQL authentication*
mysql_monitor	mysql (MySQL Server)	3306	TCP	HTTP	Basic authentication
mysql_monitor	mysql_proxy (Proxy health check)	443/8080**	TCP	HTTP	Basic authentication
mysql_proxy	mysql (MySQL Server)	3306	TCP	HTTP	MySQL authentication*
mysql_proxy	mysql (Galera health check)	9200	TCP	HTTP	Basic authentication

\* MySQL authentication uses the MySQL native password method.

\*\* Port 443 is used if mysql\_proxy is registered with the Gorouter. If not registered, mysql\_proxy uses port 8080 instead.

## Outbound communications

The following table lists network communication paths that are outbound from MySQL:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
mysql_monitor	uaa	8443	TCP	HTTPS	OAuth
mysql_proxy (Route Registrar)	nats	4222-2	TCP	NATS	Basic authentication

If you select the **Enable inactive mysql port** check box on the **Internal MySQL** pane of the TAS for VMs tile, you can run auditing and reporting queries on an inactive MySQL node over port 3336. For more information, see [Configure Internal MySQL](#).

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## NATS network communications

The following tables show NATS internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about how Cloud Foundry integrates NATS, see [TAS for VMs Routing Architecture](#).

## Publish communications

The following table lists network communications that are published to NATS:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller (Route Registrar)	nats	4222-4225	TCP	NATS	Basic authentication
loggregator_trafficcontroller (Route Registrar)	nats	4222-4225	TCP	NATS	Basic authentication
mysql_proxy (Route Registrar)*	nats	4222-4225	TCP	NATS	Basic authentication
nfs_server (Route Registrar) <sup>†</sup>	nats	4222-4225	TCP	NATS	Basic authentication
uaa (Route Registrar)	nats	4222-4225	TCP	NATS	Basic authentication
diego_cell (local Route Emitter)	nats	4222-4225	TCP	NATS	Basic authentication

<sup>\*</sup>Applies only to deployments where internal MySQL is selected as the database.

<sup>†</sup>Applies only to deployments where the internal NFS server is selected for file storage.

## Subscribe communications

The following table lists network communications that are subscribed to NATS:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
router	nats	4222-4225	TCP	NATS	Basic authentication

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## Routing network communications

The following tables show the internal network communication paths of the routing subsystem with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

### HTTP routing

The following table lists network communication paths for HTTP routing:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
diego_cell (local Route Emitter)	nats	4222	TCP	NATS	Basic authentication
Load balancer	router (Gorouter)	80	TCP	HTTP	None
Load balancer	router (Gorouter)	443	TCP	HTTPS	TLS
router (Gorouter)	nats	4222	TCP	NATS	Basic authentication
router (Gorouter)	System components	Varies	TCP	Varies	None
router (Gorouter)	App containers	Varies	TCP	Varies	Optional TLS
Load balancer	router (Gorouter)	80	TCP	HTTP	None
Load balancer	router (Gorouter)	443	TCP	HTTPS	TLS

### TCP routing (optional)

The following table lists network communication paths for TCP routing:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller	cloud_controller (Routing API)*	443	TCP	HTTPS	TLS and OAuth 2.0
cloud_controller (Routing API)	diego_database (Locket)	8891	TCP	HTTPS	Mutual TLS
cloud_controller (Routing API)	mysql_proxy	3306	TCP	MySQL	MySQL authentication**
cloud_controller (Routing API)	uaa	8443	TCP	HTTPS	TLS
diego_brain (global TCP Emitter)	cloud_controller (Routing API)	3000	TCP	HTTP	OAuth 2.0
diego_brain (global TCP Emitter)	cloud_controller (Routing API)	3001	TCP	HTTPS	Mutual TLS
diego_brain (global TCP Emitter)	uaa	8443	TCP	HTTPS	TLS
diego_cell (local Route Emitter)	cloud_controller (Routing API)	3000	TCP	HTTP	OAuth 2.0
diego_cell (local Route Emitter)	cloud_controller (Routing API)	3001	TCP	HTTPS	Mutual TLS
diego_cell (local Route Emitter)	uaa	8443	TCP	HTTPS	TLS
Load balancer	tcp_router	1024- 65535†	TCP	TCP	None
router (Gorouter)	cloud_controller (Routing API)	3000	TCP	HTTP	OAuth 2.0
router (Gorouter)	cloud_controller (Routing API)	3001	TCP	HTTPS	Mutual TLS
router (Gorouter)	uaa	8443	TCP	HTTPS	TLS
tcp_router	cloud_controller (Routing API)	3000	TCP	HTTP	OAuth 2.0
tcp_router	cloud_controller (Routing API)	3001	TCP	HTTPS	Mutual TLS
tcp_router	uaa	8443	TCP	HTTPS	TLS

\* This communication happens through a load balancer and a Gorouter. Requests are received by Routing API on port 3000 or 3001. You can use [Routing API Endpoint Protocol](#) toggle when configuring TAS for VMs tile for enabling HTTPS only

† You can use this port range to configure the port in the TAS for VMs tile.

\*\* MySQL authentication uses the MySQL native password method.

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## UAA network communications

The following tables show the User Account and Authentication (UAA) internal network communication paths with other VMware Tanzu Application Service for VMs (TAS for VMs) components.

For more information about UAA, see [User Account and Authentication \(UAA\) Server](#).

## Inbound communications

The following table lists network communication paths that are inbound to UAA:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
cloud_controller	uaa	8443	TCP	HTTPS	OAuth 2.0 or none*
diego_brain (SSH Proxy)	uaa	443	TCP	HTTPS	OAuth 2.0
loggregator_trafficcontroller	uaa	8443	TCP	HTTPS	TLS
mysql_monitor	uaa	8443	TCP	HTTPS	OAuth
router	uaa	8443	TCP	HTTPS	OAuth 2.0

\*The authentication method depends on the type of request.

## Outbound communications: Internal to TAS for VMs

The following table lists network communication paths that are outbound from UAA:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
uaa	mysql_proxy*	3306	TCP	MySQL	MySQL authentication**
uaa (Route Registrar)	nats	4222	TCP	NATS	Basic authentication

\*Applies only to deployments where internal MySQL is selected as the database.

\*\* MySQL authentication uses the MySQL native password method.

## Outbound communications: External to TAS for VMs

The following table lists network communication paths from UAA that are outbound to external systems:

Source VM	Destination VM	Port	Transport Layer Protocol	App Layer Protocol	Security and Authentication
uaa	LDAP	LDAP server communication port	TCP	LDAP/LDAPS	Basic authentication (LDAP bind)
uaa	SAML/OIDC	80 or 443 (HTTP port)	TCP	HTTP/HTTPS	Key

## BOSH DNS communications

By default, TAS for VMs components and app containers look up services using the BOSH DNS service discovery mechanism. To support this lookup, BOSH Director co-locates a BOSH DNS server on every deployed VM. For more information, see [BOSH DNS network communications](#).

## Managing apps and their stacks

These topics are your source for learning about managing apps and their stacks in VMware Tanzu Application Service for VMs (TAS for VMs):

- [Using the Stack Auditor Plug-In](#)
- [Changing Stacks](#)
- [Changing Windows Stacks](#)

## Using Stack Auditor in TAS for VMs

Stack Auditor is a cf CLI plug-in that allows you to list apps and their stacks, migrate apps to a new stack, and delete a stack. Learn how to use it on this page.

A typical use for Stack Auditor is migrating a large number of apps to a new stack. This includes moving apps from `cflinuxfs3` to `cflinuxfs4` in preparation to upgrade your deployment to a version that does not contain `cflinuxfs3`. The following table describes the workflow you can use:

Stage	Description
1	Operator audits stack usage to determine which apps need to be migrated. See <a href="#">List Apps and Their Stacks</a> .
2	Operator communicates with developers that they must migrate their existing apps to a new stack and begin pushing all new apps to the new stack.
3	Developers migrate their apps to the new stack. See <a href="#">Change Stacks</a> .
4	Operator confirms apps have been migrated.
5	Operator deletes buildpacks associated with the old stack.
6	Operator deletes the old stack. See <a href="#">Delete a Stack</a> .
	If you upgrade your deployment to a version that contains the stack you deleted, the stack returns on upgrade.
7	If applicable, operator upgrades the deployment to the version that does not contain the old stack.

# Install Stack Auditor

To install Stack Auditor:

1. Download the Stack Auditor binary for your OS from [Buildpack Extensions](#) on Broadcom Support.
2. Install the plug-in with the cf CLI:

```
cf install-plugin PATH-TO-BINARY
```

Or install from the community repo by running:

```
cf install-plugin StackAuditor
```

# Using Stack Auditor

The following sections describe how to use Stack Auditor.

## List apps and their stacks

With Stack Auditor, you can get a list of the apps in each org and space and see what stack they are using.

To see which apps are using which stack, run the following command. The output lists apps for each org you have access to. To see all the apps in your deployment, be sure to log in to the cf CLI as a user who can access all orgs.

```
cf audit-stack
```

Here is example output:

```
$ cf audit-stack
first-org/development/first-app cflinuxfs3
first-org/staging/first-app cflinuxfs3
first-org/production/first-app cflinuxfs3
second-org/development/second-app cflinuxfs4
second-org/staging/second-app cflinuxfs4
second-org/production/second-app cflinuxfs4
...
```

## Change stacks for a single app

Stack Auditor allows you to change the stack that an app uses. Stack Auditor rebuilds the app onto the new stack without a change in the source code of the app. If you want to move the app to a new stack with updated source code, follow the procedure in [Changing Stacks](#).

To change the stack an app uses:

1. Target the org and space of the app:

```
cf target -o ORG -s SPACE
```

Where:

- **ORG** is the org the app is in.
  - **SPACE** is the space the app is in.
2. Run the following command:

```
cf change-stack APP-NAME STACK-NAME
```

Where:

- **APP-NAME** is the app that you want to move to a new stack.
- **STACK-NAME** is the stack you want to move the app to.

Here is example output:

```
$ cf change-stack my-app cflinuxfs4
Attempting to change stack to cflinuxfs4 for my-app...
Starting app my-app in org pivotal-pubtools / space pivotalcf-staging a
s ljarzynski@pivotal.io...
Downloading staticfile_buildpack...

.

requested state: started
instances: 1/1
usage: 64M x 1 instance
urls: example.com
last uploaded: Wed 17 Jul 22:57:04 UTC 2024
stack: cflinuxfs4
buildpack: staticfile_buildpack

      state      since            cpu    memory      disk
logging      cpu entitlement   details
#0  running  2024-07-17T22:57:22Z   0.3%   8.2M of 64M   130.2M of 1G
0B/s of 16K/s  2.4%
```

Application my-app was successfully changed to Stack cflinuxfs4



If the app is in a **stopped** state, it remains stopped after changing stacks. Also, when attempting to change stacks, your app is stopped. If the app fails on **cflinuxfs4**, Stack Auditor attempts to restage your app on **cflinuxfs3**.

## Change stacks for all apps in a space

Stack Auditor also allows you to migrate all apps in a space to a new stack. For example, using jq you can write a script to find all apps in a space and migrate them to cflinuxfs4:

```
cf audit-stack --json | jq -r 'map(select(.stack == "cflinuxfs3")) | .[] | "cf target -o \(.org) -s \(.space) && cf change-stack \(.name) cflinuxfs4" | xargs -i{} bash -c {}'
```

## Delete a stack

Stack Auditor allows you to delete a stack from your deployment. You must be an admin user to delete a stack.

1. To delete a stack, run the following command. This action cannot be undone, with the following exception: If you upgrade your deployment to a version that contains the stack you deleted, the stack returns on upgrade.

```
cf delete-stack STACK-NAME
```

Where `STACK-NAME` is the name of the stack you want to delete.

Here is example output:

```
$ cf delete-stack cflinuxfs3
Are you sure you want to remove the cflinuxfs3 stack? If so, type the name of the stack [cflinuxfs3]
>cflinuxfs3
Deleting stack cflinuxfs3...
Stack cflinuxfs3 has been deleted.
```

If you have any apps still running on `cflinuxfs3`, the command returns the following error:

```
Failed to delete stack cflinuxfs3 with error: Please delete the app associations for your stack.
```

## Contacting users of apps

If you are having problems with an app and need help, you can use the cf CLI to get a list of email addresses of users in a space. For example, run:

```
cf space-users ORG-NAME SPACE-NAME
```

Where:

- `ORG-NAME` is the org the app is in.
- `SPACE-NAME` is the space the app is in.

## Known issues

The following are known issues with changing stacks from cflinuxfs3 to cflinuxfs4.

### OpenSSL1.1 is not included in cflinuxfs4

cflinuxfs4 does not include OpenSSL1.1. If your application depends on OpenSSL1.1, for example, a static file buildpack containing an executable but using the system libraries for SSL, it will fail to run. Ensure that your application can be rebuilt against OpenSSL3 or include the OpenSSL1.1 libraries with your application.

### .NET 6 and GSS requires legacy provider

If your application is .NET 6 and uses GSS, you may see the following error message:

GSSAPI operation failed with error - Unspecified GSS failure. Minor code may provide more information (Crypto routine failure).

There is an existing .NET issue about this failure, which is related to legacy usage of OpenSSL3. For more information, see [GSS failures in System.Net.Http.Functional.Tests on Ubuntu 22.04re](#) on GitHub. The workaround is listed [on the same page](#) and involves explicitly loading the legacy provider.

## .NET Core apps and LDAP

If your application is .NET Core and using LDAP connectivity, you may see the following error message if you are using cflinuxfs4 prior to v1.45.0:

```
"ThreadName": ".NET ThreadPool Worker", "Message": "#414 Failed to establish connection to domain: [{\"Domain\": \"myldap-domain.com\", \"Host\": \"dc=emea,dc=org,dc=com\", \"Base\": \"emea\", \"Name\": \"EUROPE\"}] exception: The type initializer for 'Ldap' threw an exception.", "Description": "#414 Failed to establish connection to domain: [{\"Domain\": \"myldap-domain.com\", \"Host\": \"dc=emea,dc=org,dc=com\", \"Base\": \"emea\", \"Name\": \"EUROPE\"}] exception: The type initializer for 'Ldap' threw an exception.", "Environment": "ge4-sit", "Exception": " ", "RequestHandler": "Controller: Action:", "CallStack": "Org.DSA.Shared.Logger.ApiLogger.Log" }
```

The issue is related to a stack-level LDAP package that wasn't available in cflinuxfs4 until v1.45.0 and its interaction with the `System.DirectoryServices.Protocols` package.

To resolve the problem: \* Upgrade the cflinuxfs4 stack. \* Upgrade the `System.DirectoryServices` NuGet package to version 8.0.0 or higher. You can do this in the application using the following command:

```
<pre class="terminal">
<PackageReference Include="System.DirectoryServices.Protocols" Version="8.0.0" />
</pre>
```

## Ruby 3.1 or later is required

Ruby 3.1, introduced in Ruby buildpack v1.8.51, or later is required for the Ruby buildpack running on cflinuxfs4. Upgrade your application to work with Ruby 3.1 or later by specifying it in your application's Gemfile and working through any issues that result. If an application specifies a version of Ruby in its Gemfile not included in the buildpack, it results in the following error message:

```
**ERROR** Unable to determine ruby: Unable to determine ruby version: Running ruby: No Matching versions, ruby = 2.7.6 not found in this buildpack
.....
Failed to compile droplet: Failed to run all supply scripts: exit status 15
```

This happens because Ruby v2.7 and v3.0 are incompatible with OpenSSL3, which is the version of OpenSSL in cflinuxfs4.

## Changing stacks

You can restage apps on a new stack. Here is a description of stacks and lists of stacks that are supported on .

To restage a Windows app on a new Windows stack, see [Changing Windows stacks](#).

You can also use the Stack Auditor plug-in for the Cloud Foundry Command Line Interface (cf CLI) when changing stacks. See [Using the Stack Auditor plug-in](#).

## Overview

A stack is a prebuilt root file system (rootfs) that supports a specific operating system. For example, Linux-based systems need `/usr` and `/bin` directories at their root. The stack works in tandem with a buildpack to support apps running in compartments. Under Diego architecture, cell VMs can support multiple stacks.



Docker apps do not use stacks.

## Available stacks

TAS for VMs includes support for `cflinuxfs3`. The Linux `cflinuxfs3` stack is derived from Ubuntu Bionic 18.04. For more information about supported libraries, see the [GitHub stacks page](#).

The latest versions of TAS for VMs include support for `cflinuxfs4` which is derived from Ubuntu 22.04 LTS (Jammy Jellyfish). For more information, see [GitHub cflinuxfs4 stack receipt](#).

## Restaging apps on a new stack

For security, stacks receive regular updates to address Common Vulnerabilities and Exposures ([CVEs](#)). Apps pick up on these stack changes through new releases of TAS for VMs. However, if your app links statically to a library provided in the rootfs, you might have to manually restage it to pick up the changes.

It can be difficult to know what libraries an app statically links to, and it depends on the languages you are using. One example is an app that uses a Ruby or Python binary, and links out to part of the C standard library. If the C library requires an update, you might need to recompile the app and restage it.

To restage an app on a new stack:

1. Use the `cf stacks` command to list the stacks available in a deployment.

```
$ cf stacks
Getting stacks in org MY-ORG / space development as developer@example.com...
OK

name      description
cflinuxfs3  Cloud Foundry Linux-based filesystem (Ubuntu 18.04)
cflinuxfs4  Cloud Foundry Linux-based filesystem (Ubuntu 22.04)
```

2. To change your stack and restage your app, run:

```
cf push MY-APP -s STACK-NAME
```

Where: - MY-APP is the name of the app. - STACK-NAME is the name of the new stack.

For example, to restage your app on the stack `cflinuxfs4`, run `cf push MY-APP -s cflinuxfs4`:

```
$ cf push MY-APP -s cflinuxfs4 Using stack cflinuxfs4... OK Creating app
MY-APP in org MY-ORG / space development as developer@example.com... OK ...
requested state: started instances: 1/1 usage: 1G x 1 instances urls: M
Y-APP.cfapps.io last uploaded: Wed 17 Jul 22:57:04 UTC 2024 state      s
ince          cpu     memory     disk     logging
cpu entitlement details #0 running 2024-07-17T22:57:22Z 0.3% 4
9.5M of 1G 130.2M of 1G 0B/s of 16K/s 2.4%
```

## Stacks API

For API information, see the *Stacks* section of the [Cloud Foundry API Documentation](#).

## Restaging your apps on a Windows stack

This topic explains how you can restage apps on a new Windows stack. It also describes what stacks are and lists the supported Windows stacks on .

To restage a Windows app on a new Linux stack, see [Changing stacks](#).

You can also use the Stack Auditor plug-in for the Cloud Foundry Command Line Interface (cf CLI) when changing stacks. See [Using the Stack Auditor plug-in](#).

## Overview

A stack is a prebuilt root file system (rootfs) that supports a specific operating system. For example, Linux-based systems need `/usr` and `/bin` directories at their root and Windows needs `/windows`. The stack works in tandem with a buildpack to support apps running in compartments. Under Diego architecture, cell VMs can support multiple stacks.



Docker apps do not use stacks.

## Available stacks

If you push your TAS for VMs [Windows] app to a Windows stack, you must use `windows`. The `windows2016` stack is not supported on TAS for VMs [Windows].

## Restaging apps on a new stack

For security, stacks receive regular updates to address Common Vulnerabilities and Exposures ([CVEs](#)). Apps pick up on these stack changes through new releases of TAS for VMs [Windows]. However, if your app links statically to a library provided in the rootfs, you have to manually restage it to pick up the changes.

It can be difficult to know what libraries an app statically links to, and it depends on the languages you are using. One example is an app that uses a Ruby or Python binary, and links out to part of the C standard

library. If the C library requires an update, you might need to recompile the app and restage it.

To restage an app on a new stack:

1. Use the `cf stacks` command to list the stacks available in a deployment.

```
$ cf stacks
Getting stacks in org MY-ORG / space development as developer@example.com...
OK

name          description
windows2016   Windows Server 2016
windows       Windows Server
```

2. To change your stack and restage your app, run:

```
cf push MY-APP -s STACK-NAME
```

Where: - MY-APP is the name of the app. - STACK-NAME is the name of the new stack.

For example, to restage your app on the `windows` stack, run `cf push MY-APP -s windows`:

```
$ cf push MY-APP -s windows
Using stack windows...
OK
Creating app MY-APP in org MY-ORG / space development as developer@example.com...
OK
...
requested state: started
instances: 1/1
usage: 1G x 1 instances
urls: MY-APP.cfapps.io
last uploaded: Wed 17 Jul 22:57:04 UTC 2024
     state      since            cpu    memory      disk
logging      cpu entitlement  details
\#0  running  2024-07-17T22:57:22Z  0.3%  49.5M of 1G  130.2M of 1G
0B/s of 16K/s  2.4%
```

## Stacks API

For API information, see the “Stacks” section of the [Cloud Foundry API documentation](#).

# Developing apps

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- Available Cloud Controller API client libraries
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  - Running tasks in your apps
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## Designing and running your app in the cloud

These are best practices for developing modern apps for cloud platforms. For more detailed reading about good app design for the cloud, see [The Twelve-Factor App](#).

Following these guidelines facilitates app deployment to Operations Manager and other cloud platforms, and apps written in supported frameworks often run unmodified.

For more information about the features of HTTP routing handled by the Gorouter in Operations Manager, see [HTTP routing](#). For more information about the life cycle of application containers, see [Application container life cycle](#).

## Avoid writing to the local file system

Apps running on Operations Manager must not write files to the local file system because:

- **Local file system storage is short-lived.** When an app instance fails or stops, the resources assigned to that instance are reclaimed by the platform, including any local disk changes made since the app started. When the instance is restarted, the app starts with a new disk image. Although your app can write local files while it is running, the files disappear after the app restarts.
- **Instances of the same app do not share a local file system.** Each app instance runs in its own isolated container. Therefore, a file written by one instance is not visible to other instances of the same app. If the files are temporary, this is not be a problem. However, if your app needs the data in the files to persist across app restarts, or the data must be shared across all running instances of the app, the local file system must not be used. VMware recommends using a shared data service like a database or blobstore for this purpose.

For example, instead of using the local file system, you can use a Operations Manager service such as the MongoDB document database or a relational database like MySQL or PostgreSQL. Another option is to use cloud storage providers such as [Amazon S3](#), [Google Cloud Storage](#), [Dropbox](#), or [Box](#). If your app must communicate across different instances of itself, consider a cache like Redis or a messaging-based architecture with RabbitMQ.

If you must use a file system for your app because, for example, your app interacts with other apps through a network attached file system or because your app is based on legacy code that you cannot rewrite, consider using volume services to bind a network attached file system to your app. For more information, see [Using an external file system \(volume services\)](#).

## Cookies accessible across apps

In an environment with shared domains, cookies might be accessible across apps.

Many tracking tools such as Google Analytics and Mixpanel use the highest available domain to set their cookies. For an app using a shared domain such as `example.com`, a cookie set to use the highest domain has a `Domain` attribute of `.example.com` in its HTTP response header. For example, an app at `my-app.shared-domain.example.com` might be able to access the cookies for an app at `your-app.shared-domain.example.com`.

You must decide whether you want your apps or tools that use cookies to set and store the cookies at the highest available domain.

## Port considerations

Clients connect to apps running on Operations Manager by making requests to URLs associated with the app. Operations Manager allows HTTP requests to apps on ports 80 and 443. For more information, see [Routes and domains](#).

Operations Manager also supports WebSocket handshake requests over HTTP containing the `Upgrade` header. The Operations Manager router handles the upgrade and initiates a TCP connection to the app to form a WebSocket connection.

To support WebSockets, the operator must configure the load balancer correctly. Depending on the configuration, clients may have to use a different port for WebSocket connections, such as port 4443, or a different domain name. For more information, see [Supporting WebSockets](#).

## Operations Manager updates and your app

For app management purposes, Operations Manager might need to stop and restart your app instances. If this occurs, Operations Manager performs the following steps:

1. Operations Manager sends a single `termination signal` to the root process that your start command runs.
2. Operations Manager waits 10 seconds to allow your app to cleanly shut down any child processes and handle any open connections.
3. After 10 seconds, Operations Manager shuts down your app.

Your app must accept and handle the termination signal to ensure that it shuts down gracefully. To achieve this, the app is expected to do these steps when shutting down:

1. App receives termination signal
2. App closes listener so that it stops accepting new connections
3. App finishes serving in-flight requests
4. App closes existing connections as their requests complete
5. App is stopped or shut down

For an implementation of the expected shutdown behavior in Golang, see the [Sample HTTP App](#) repository on GitHub.

## Ignore unnecessary files when pushing

By default, when you push an app, all files in the app's project directory tree are uploaded to your Operations Manager instance, except version control and configuration files or directories with these names:

- `.cfignore`
- `_darcs`
- `.DS_Store`
- `.git`
- `.gitignore`
- `.hg`
- `manifest.yml`
- `.svn`

In addition to these, if API request diagnostics are directed to a log file and the file is within the project directory tree, it is excluded from the upload. You can direct these API request diagnostics to a log file using `cf config --trace` or the `CF_TRACE` environment variable.

If the app directory contains other files, such as `temp` or `log` files, or complete subdirectories that are not required to build and run your app, you might want to add them to a `.cfignore` file to exclude them from upload. Especially with a large app, uploading unnecessary files can slow app deployment.

To use a `.cfignore` file, create a text file named `.cfignore` in the root of your app directory structure. In this file, specify the files or file types you wish to exclude from upload. For example, these lines in a `.cfignore` file exclude the “tmp” and “log” directories.

```
tmp
log
```

The file types you might want to exclude vary, based on the app frameworks you use. For examples of commonly-used `.gitignore` files, see the [gitignore](#) repository on GitHub.

## Run multiple instances to increase availability

Singleton apps might become temporarily unavailable for reasons that include:

- During an upgrade, Operations Manager gracefully shuts down the apps running on each Diego Cell and restarts them on another Diego Cell. Single app instances might become temporarily unavailable if the replacement instance does not become healthy within the Diego Cell's evacuation timeout. The default timeout is 10 minutes.
- Unexpected faults in Operations Manager system components or underlying infrastructure, such as container-host VMs or IaaS availability zones, might cause lone app instances to disappear or become unrouteable for a minute or two.

To avoid the risk of an app becoming temporarily unavailable, developers can run more than one instance of the app.

## Using buildpacks

A buildpack consists of bundles of detection and configuration scripts that provide framework and runtime support for your apps. When you deploy an app that requires a buildpack, Operations Manager installs the buildpack on the Diego Cell where the app runs.

For more information, see [Using Classic Buildpacks in Cloud Foundry](#).

## TAS for VMs environment variables

Environment variables are the means TAS for VMs uses to communicate with a deployed app about its environment.

For information about setting your own app-specific environment variables, see the [Environment variable in Deploying with app manifests](#).



Do not use user-provided environment variables for security-sensitive information such as credentials. They might unintentionally show up in cf CLI output and Cloud Controller logs. Use [user-provided service instances](#) instead. The system-provided environment variable `VCAP_SERVICES` is properly redacted for user roles such as Space Supporter and in Cloud Controller log files.



The maximum size of an environment variable is 130 KB. This limit applies also to TAS for VMs system environment variables such as `VCAP_SERVICES` and `VCAP_APPLICATION`.

## View environment variables

Using the Cloud Foundry Command Line Interface (cf CLI), you can run the `cf env` command to view the TAS for VMs environment variables for your app. The `cf env` command displays the following environment variables:

- The `VCAP_APPLICATION` and `VCAP_SERVICES` variables provided in the container environment
- The user-provided variables set using the `cf set-env` command

There are three possible ways of providing service binding data to apps, see [Credential Delivery Methods](#). Depending on the chosen method there will be one of the following environment variables:

- `VCAP_SERVICES`
- `SERVICE_BINDING_ROOT` (experimental)
- `VCAP_SERVICES_FILE_PATH` (experimental)

For more information about the `cf env` command, enter `cf env --help`.

For more information about the `cf set-env` command, enter `cf set-env --help`.

The following example demonstrates the environment variables `cf env` displays:

```
$ cf env my-app
Getting env variables for app my-app in org my-org / space my-space as
admin...
OK
System-Provided:
```

```
{
  "VCAP_APPLICATION": {
    "application_id": "fa05c1a9-0fc1-4fbd-bae1-139850dec7a3",
    "application_name": "my-app",
    "application_uris": [
      "my-app.example.com"
    ],
    "application_version": "fb8fbcc6-8d58-479e-bcc7-3b4ce5a7f0ca",
    "cf_api": "https://api.example.com",
    "limits": {
      "disk": 1024,
      "fds": 16384,
      "mem": 256
    },
    "name": "my-app",
    "organization_id": "c0134bad-97a9-468d-ab9d-e97547e3aed5",
    "organization_name": "my-org",
    "space_id": "06450c72-4669-4dc6-8096-45f9777db68a",
    "space_name": "my-space",
    "uris": [
      "my-app.example.com"
    ],
    "users": null,
    "version": "fb8fbcc6-8d58-479e-bcc7-3b4ce5a7f0ca"
  }
}
```

#### User-Provided:

MY\_DRAIN: http://drain.example.com  
 MY\_ENV\_VARIABLE: 100

## App-specific system variables

This section describes the environment variables that TAS for VMs makes available to your application container. Some of these variables are the same across instances of a single app, and some vary from instance to instance.

You can access environment variables programmatically, including variables defined by the buildpack. For more information, see the buildpack documentation for [Java](#), [Node.js](#), and [Ruby](#).

The following table lists the system variables available to your application container.

Environment Variable	Running	Staging	Task
CF_INSTANCE_ADDR	x	x	x
CF_INSTANCE_GUID	x		x
CF_INSTANCE_INDEX	x		
CF_INSTANCE_INTERNAL_IP	x	x	x

Environment Variable	Running	Staging	Task
CF_INSTANCE_IP	X	X	X
CF_INSTANCE_PORT	X	X	X
CF_INSTANCE_PORTS	X	X	X
CF_STACK		X	
DATABASE_URL	X		X
HOME	X	X	X
INSTANCE_GUID	X		
INSTANCE_INDEX	X		
LANG	X	X	X
MEMORY_LIMIT	X	X	X
PATH	X	X	X
PORT	X		
PWD	X	X	X
TMPDIR	X		X
USER	X	X	X
VCAP_APP_HOST	X		
VCAP_APP_PORT	X		
VCAP_APPLICATION	X	X	X
VCAP_SERVICES	X	X	X

## CF\_INSTANCE\_ADDR

The `CF_INSTANCE_IP` and `CF_INSTANCE_PORT` of the app instance, in the format `IP:PORT`.

For example: `CF_INSTANCE_ADDR=1.2.3.4:5678`

For more information, see [CF\\_INSTANCE\\_IP](#) and [CF\\_INSTANCE\\_PORT](#).

## CF\_INSTANCE\_GUID

The UUID of the app instance.

For example: `CF_INSTANCE_GUID=41653aa4-3a3a-486a-4431-ef258b39f042`

## CF\_INSTANCE\_INDEX

The index number of the app instance.

For example: `CF_INSTANCE_INDEX=0`

## CF\_INSTANCE\_IP

The external IP address of the host running the app instance.

For example: `CF_INSTANCE_IP=1.2.3.4`

## **CF\_INSTANCE\_INTERNAL\_IP**

The internal IP address of the container running the app instance.

For example: `CF_INSTANCE_INTERNAL_IP=5.6.7.8`

## **CF\_INSTANCE\_PORT**

The external (host-side) port corresponding to the internal (container-side) port with value `PORT`. This value is usually different from the `PORT` of the app instance.

For example: `CF_INSTANCE_PORT=61045`

For more information, see [PORT](#).

## **CF\_INSTANCE\_PORTS**

The list of mappings between internal (container-side) and external (host-side) ports allocated to the container running the app instance. Not all of the internal ports are necessarily available for the app to bind to, as some of them might be used by system-provided services that also run inside the container. These internal and external values might differ.

For example: `CF_INSTANCE_PORTS=[{external:61045,internal:8080}, {external:61046,internal:2222}]`

## **DATABASE\_URL**

For apps bound to certain services that use a database, TAS for VMs creates a `DATABASE_URL` environment variable based on the `VCAP_SERVICES` environment variable.

TAS for VMs uses the structure of the `VCAP_SERVICES` environment variable to populate the `DATABASE_URL` environment variable. TAS for VMs recognizes any service containing a JSON object like the following example as a candidate for the `DATABASE_URL` environment variable and uses the first candidate it finds.

```
{
  "some-service": [
    {
      "credentials": {
        "uri": "SOME-DATABASE-URL"
      }
    }
  ]
}
```

For example, see the following `VCAP_SERVICES` environment variable example:

```
VCAP_SERVICES =
{
  "elephantsql": [
    {
      "name": "elephantsql-c6c60",
      "credentials": {
        "uri": "SOME-DATABASE-URL"
      }
    }
  ]
}
```

```

    "label": "elephantsql",
    "credentials": {
      "uri": "postgres://exampleuser:examplepass@babar.elephantsql.com:5432/exampled
b"
    }
  ]
}

```

Based on this `VCAP_SERVICES` environment variable, TAS for VMs creates the following `DATABASE_URL` environment variable:

```
DATABASE_URL = postgres://exampleuser:examplepass@babar.elephantsql.com:5432/exampledb
```

For more information, see [VCAP\\_SERVICES](#).

## HOME

The root directory for the deployed app.

For example: `HOME=/home/vcap/app`

## LANG

Required by buildpacks to ensure consistent script load order.

For example: `LANG=en_US.UTF-8`

## MEMORY\_LIMIT

The maximum amount of memory that each instance of the app can consume. You specify this value in an app manifest or with the cf CLI when pushing an app. The value is limited by space and org quotas.

If an instance exceeds the maximum limit, it is restarted. If TAS for VMs is asked to restart an instance too frequently, the instance is stopped.

For example: `MEMORY_LIMIT=512M`

## PORt

The port on which the app listens for requests. TAS for VMs allocates a port for each instance of the app, so code that obtains or uses the app port refers to it using the `PORT` environment variable.

For example: `PORT=8080`

## PWD

The present working directory where the buildpack that processed the app ran.

For example: `PWD=/home/vcap/app`

## TMPDIR

The directory location where temporary and staging files are stored.

For example: `TMPDIR=/home/vcap/tmp`

## USER

The user account under which the app runs.

For example: `USER=vcap`

## VCAP\_APP\_PORT

Deprecated name for the `PORT` variable.

## VCAP\_APPLICATION

This environment variable contains the associated attributes for a deployed app. Results are returned in JSON format. The following table lists the attributes that are returned.

Attribute	Description
<code>application_id</code>	The GUID identifying the app
<code>application_name</code>	The name assigned to the app when it was pushed
<code>application_uris</code>	The URIs assigned to the app
<code>application_version</code>	The GUID identifying a version of the app. Each time an app is pushed or restarted, this value is updated
<code>cf_api</code>	The location of the Cloud Controller API for the TAS for VMs deployment where the app runs
<code>host</code>	Deprecated. The IP address of the app instance
<code>limits</code>	The limits to disk space, number of files, and memory permitted to the app. Memory and disk space limits are supplied when the app is deployed, either on the command line or in the app manifest. The number of files allowed is operator-defined
<code>name</code>	Identical to <code>application_name</code>
<code>organization_id</code>	The GUID identifying the org where the app is deployed
<code>organization_name</code>	The human-readable name of the org where the app is deployed
<code>process_id</code>	The UID identifying the process. Only present in running application containers
<code>process_type</code>	The type of process. Only present in running application containers
<code>space_id</code>	The GUID identifying the space where the app is deployed
<code>space_name</code>	The human-readable name of the space where the app is deployed
<code>start</code>	The human-readable timestamp for the time the instance was started. Not provided on Diego Cells
<code>started_at</code>	Identical to <code>start</code> . Not provided on Diego Cells
<code>started_at_timestmap</code>	The UNIX epoch timestamp for the time the instance was started. Not provided on Diego Cells

Attribute	Description
<code>state_timestamp</code>	Identical to <code>started_at_timestamp</code> . Not provided on Diego Cells
<code>uris</code>	Identical to <code>application_uris</code> . You must ensure that both <code>application_uris</code> and <code>uris</code> are set to the same value.
<code>users</code>	Deprecated. Not provided on Diego Cells
<code>version</code>	Identical to <code>application_version</code>

## VCAP\_SERVICES

For bindable services, TAS for VMs adds connection details to the `VCAP_SERVICES` environment variable when you restart your app, after binding a service instance to your app. For more information about bindable services, see [Services overview](#).

TAS for VMs returns the results as a JSON document that contains an object for each service for which one or more instances are bound to the app. The service object contains a child object for each instance of the service that is bound to the app.

The following table defines the attributes that describe a bound service. The key for each service in the JSON document is the same as the value of the “label” attribute.

Attribute	Description
<code>binding_guid</code>	The GUID of the service binding
<code>binding_name</code>	The name assigned to the service binding by the user
<code>instance_guid</code>	The GUID of the service instance
<code>instance_name</code>	The name assigned to the service instance by the user
<code>name</code>	The <code>binding_name</code> , if it exists. Otherwise, the <code>instance_name</code>
<code>label</code>	The name of the service offering
<code>tags</code>	An array of strings an app can use to identify a service instance
<code>plan</code>	The service plan selected when the service instance was created
<code>credentials</code>	A JSON object containing the service-specific credentials needed to access the service instance
<code>syslog_drain_url</code>	The service-specific syslog drain URL
<code>volume_mounts</code>	An array of service-specific volume mounts

To see the value of the `VCAP_SERVICES` environment variable for an app pushed to TAS for VMs, see [View environment variable values](#).

The following example shows the value of the `VCAP_SERVICES` environment variable for bound instances of several services available in the Marketplace.

```
VCAP_SERVICES=
{
  "elephantsql": [
    {
      "label": "elephantsql",
      "name": "elephantsql",
      "plan": "Standard"
    }
  ]
}
```

```

    "name": "elephantsql-binding-c6c60",
    "binding_guid": "44ceb72f-100b-4f50-87a2-7809c8b42b8d",
    "binding_name": "elephantsql-binding-c6c60",
    "instance_guid": "391308e8-8586-4c42-b464-c7831aa2ad22",
    "instance_name": "elephantsql-c6c60",
    "label": "elephantsql",
    "tags": [
        "postgres",
        "postgresql",
        "relational"
    ],
    "plan": "turtle",
    "credentials": {
        "uri": "postgres://exampleuser:examplepass@babar.elephantsql.com:5432/exampleuser"
    },
    "syslog_drain_url": null,
    "volume_mounts": []
}
],
"sendgrid": [
{
    "name": "mysendgrid",
    "binding_guid": "6533b1b6-7916-488d-b286-ca33d3fa0081",
    "binding_name": null,
    "instance_guid": "8c907d0f-ec0f-44e4-87cf-e23c9ba3925d",
    "instance_name": "mysendgrid",
    "label": "sendgrid",
    "tags": [
        "smtp"
    ],
    "plan": "free",
    "credentials": {
        "hostname": "smtp.sendgrid.net",
        "username": "QvsXMbJ3rK",
        "password": "HCHMOYluTv"
    },
    "syslog_drain_url": null,
    "volume_mounts": []
}
]
}

```

## Environment variable groups

Environment variable groups are system-wide variables that allow operators to apply a group of environment variables to all running apps and all staging apps separately.

An environment variable group consists of a single hash of name-value pairs that are later inserted into an application container at runtime or at staging. These values can contain information such as HTTP proxy information. The values for variables set in an environment variable group are case-sensitive.

When creating environment variable groups:

- Only the TAS for VMs operator can set the hash value for each group.
- All authenticated users can get the environment variables assigned to their app.

- All variable changes take effect after the operator restarts or restages the apps.
- Any user-defined variable takes precedence over environment variables provided by these groups.

The following table lists the commands for environment variable groups.

CLI Command	Description
<code>running-environment-variable-group</code> or <code>revg</code>	Retrieves the contents of the running environment variable group
<code>staging-environment-variable-group</code> or <code>sevg</code>	Retrieves the contents of the staging environment variable group
<code>set-staging-environment-variable-group</code> or <code>ssevg</code>	Passes parameters as JSON to create a staging environment variable group
<code>set-running-environment-variable-group</code> or <code>srevg</code>	Passes parameters as JSON to create a running environment variable group

The following examples demonstrate how to retrieve the environment variables:

```
$ cf revg
Retrieving the contents of the running environment variable group as
sampledeveloper@example.com...
OK
Variable Name      Assigned Value
HTTP Proxy        198.51.100.130

$ cf sevg
Retrieving the contents of the staging environment variable group as
sampledeveloper@example.com...
OK
Variable Name      Assigned Value
HTTP Proxy        203.0.113.105
EXAMPLE-GROUP     2001

$ cf apps
Getting apps in org SAMPLE-ORG-NAME / space dev as
sampledeveloper@example.com...
OK

name      requested state    instances   memory   disk    urls
my-app   started           1/1        256M     1G      my-app.com

$ cf env APP-NAME
Getting env variables for app APP-NAME in org SAMPLE-ORG-NAME / space dev as
sampledeveloper@example.com...
OK

System-Provided:

{
```

`"VCAP_APPLICATION": {  
 "application_name": "APP-NAME",  
 "application_uris": [  
 "http://my-app.com"  
 ]  
}`

```

    "my-app.example.com"
],
"application_version": "7d0d64be-7f6f-406a-9d21-504643147d63",
"limits": {
  "disk": 1024,
  "fds": 16384,
  "mem": 256
},
"name": "APP-NAME",
"organization_id": "c0134bad-97a9-468d-ab9d-e97547e3aed5",
"organization_name": "my-org",
"space_id": "37189599-2407-9946-865e-8ebd0e2df89a",
"space_name": "dev",
"uris": [
  "my-app.example.com"
],
"users": null,
"version": "7d0d64be-7f6f-406a-9d21-504643147d63"
}
}
}

```

Running Environment Variable Groups:  
HTTP Proxy: 198.51.100.130

Staging Environment Variable Groups:  
EXAMPLE-GROUP: 2001  
HTTP Proxy: 203.0.113.105

The following examples demonstrate how to set environment variables:

```

$ cf ssevg '{"test":"198.51.100.130","test2":"203.0.113.105"}'
Setting the contents of the staging environment variable group as admin...
OK
$ cf sevg
Retrieving the contents of the staging environment variable group as admin...
OK
Variable Name      Assigned Value
test                198.51.100.130
test2               203.0.113.105

$ cf srevg '{"test3":"2001","test4":"2010"}'
Setting the contents of the running environment variable group as admin...
OK
$ cf revg
Retrieving the contents of the running environment variable group as admin...
OK
Variable Name      Assigned Value
test3               2001
test4               2010

```

# Available Cloud Controller API client libraries

Here is a list of the client libraries you can use with the Cloud Foundry API (CAPI) for VMware Tanzu Application Service for VMs (TAS for VMs).

## CAPI overview

CAPI is the entry point for most operations within the TAS for VMs platform. You can use it to manage orgs, spaces, and apps, which includes user roles and permissions. You can also use CAPI to manage the services provided by your TAS for VMs deployment, including provisioning, creating, and binding them to apps.

For more information, see the [CAPI documentation](#).

## Client libraries

While you can develop apps that use CAPI by calling it directly as in the API documentation, you might want to use an existing client library. See the following available client libraries.

### Supported

TAS for VMs supports the following clients for CAPI:

- [Java](#)
- Scripting: enter `cf help curl`

### Experimental

The following client is experimental and is a work in progress:

- [Golang](#)

### Unofficial

TAS for VMs does not support the following clients, but might be supported by third parties:

- Python:
  - [cloudfoundry-community/cf-python-client](#)

## Routes and domains

In this section:

- [Configuring routes and domains](#)
- [Configuring per-route options](#)
- [Routing HTTP/2 and gRPC traffic to apps](#)
- [Configuring TAS for VMs to route traffic to apps on custom ports](#)

## Configuring routes and domains

Developers and administrators can configure routes and domains for their apps using the Cloud Foundry Command Line Interface (cf CLI). This topic describes how routes and domains work in VMware Tanzu Application Service for VMs (TAS for VMs). For more information about routing capabilities in TAS for VMs, see [HTTP routing](#).

## Routes

The TAS for VMs Gorouter routes requests to apps by associating an app with an address, known as a route. This is known as a *mapping*. Use the `cf CLI cf map-route` command to associate an app and route.

The routing tier compares each request with a list of all the routes mapped to apps and attempts to find the best match. For example, the Gorouter makes the following matches for the two routes `example-app.shared-domain.example.com` and `example-app.shared-domain.example.com/products`:

Request	Matched Route
<code>http://example-app.shared-domain.example.com</code>	<code>example-app.shared-domain.example.com</code>
<code>http://example-app.shared-domain.example.com/contact</code>	<code>example-app.shared-domain.example.com</code>
<code>http://example-app.shared-domain.example.com/products</code>	<code>example-app.shared-domain.example.com/products</code>
<code>http://example-app.shared-domain.example.com/products/123</code>	<code>example-app.shared-domain.example.com/products</code>
<code>http://products.shared-domain.example.com</code>	No match; 404

The Gorouter does not use a route to match requests until the route is mapped to an app. In the example, `products.shared-domain.example.com` might have been created as a route in TAS for VMs, but until it is mapped to an app, requests for the route receive a 404 error.

The routing tier knows the location of instances for apps mapped to routes. After the routing tier calculates a route as the best match for a request, it makes a load-balancing calculation using the configured balancing algorithm (by default, this is [round-robin](#)), and forwards the request to an instance of the mapped app.

Developers can map many apps to a single route, resulting in load-balanced requests for the route across all instances of all mapped apps. This approach activates the blue/green rolling deployment strategy. Developers can also map an individual app to multiple routes, enabling access to the app from many URLs. The number of routes that can be mapped to each app is approximately 1000 (128 KB).

Routes belong to a space, and developers can only map apps to a route created in or shared with the same space. For more information about sharing routes across spaces, see [Share a route with another space](#).

Routes are globally unique. Developers in one space cannot create a route with the same URL as developers in another space, regardless of which orgs control these spaces.

## HTTP versus TCP routes

By default, TAS for VMs only supports routing of HTTP requests to apps.

Routes are considered HTTP if they are created from HTTP domains, and TCP if they are created from TCP domains. For more information, see [HTTP versus TCP shared domains](#).

HTTP routes include a domain, a host name (optional), and a context path (optional). `shared-domain.example.com`, `example-app.shared-domain.example.com`, and `example-app.shared-domain.example.com/products` are all examples of HTTP routes. Apps listen to the `localhost` port defined by the `$PORT` environment variable, which is `8080` on Diego. For example, requests to `example-app.shared-domain.example.com` are routed to the application container at `localhost:8080`.

Requests to HTTP routes must be sent to ports `80` or `443`. Ports cannot be reserved for HTTP routes. You can update the ports on which an app can receive requests through the Cloud Controller API. For more information, see [Configuring apps to listen on custom ports \(Beta\)](#).

TCP routes include a domain and a route port. A route port is the port clients make requests to. This is not the same port as what an app pushed to TAS for VMs listens on. `tcp.shared-domain.example.com:60000` is an example of a TCP route. Just as for HTTP routes, apps listen to the `localhost` port defined by the `$PORT` environment variable, which is `8080` on Diego. For example, requests to `tcp.shared-domain.example.com:60000` are routed to the application container at `localhost:8080`.

When a port is reserved for a route, it cannot be reserved for another route. Host name and path are not supported for TCP routes.

## Internal container-to-container routes

TAS for VMs apps can communicate with each other securely and directly over internal routes that never leave the platform. Apps running on Windows cells cannot use internal, container-to-container routes.

To create an internal route:

1. Use the `cf map-route` command with an [internal domain](#). For example:

```
$ cf map-route app apps.internal --hostname app
```

- After an internal route is mapped to an app, the route resolves to IP addresses of the app instances. The IP addresses are visible in the application container:

```
$ cf ssh app
vcap@1234:~$ host app.apps.internal
app.apps.internal has address 10.255.169.200
app.apps.internal has address 10.255.49.7
app.apps.internal has address 10.255.49.77
```

- To resolve individual instances, prepend the index to the internal route.

```
vcap@1234:~$ host 1.app.apps.internal
1.app.apps.internal has address 10.255.49.7
```

2. Create a network policy that allows your apps to communicate with each other. By default, apps cannot communicate over the container network. For more information, see [Configuring container-to-container networking](#), or enter `cf add-network-policy --help`.

## Create a route

When a developer creates a route using the `cf` CLI, TAS for VMs determines whether the route is an HTTP or a TCP route based on the domain. To create a HTTP route, a developer must choose an HTTP domain. To create a TCP route, a developer must choose a TCP domain.

Domains in TAS for VMs provide a namespace from which to create routes. To list available domains for a targeted organization, use the `cf domains` command. For more information about domains, see [Domains](#).

The following sections describe how developers can create HTTP and TCP routes for different use cases.

### Create an HTTP route with host name

In TAS for VMs, a hostname is the label that indicates a subdomain of the domain associated with the route. Given a domain `shared-domain.example.com`, a developer can create the route `example-app.shared-domain.example.com` by specifying the hostname `example-app` with the `cf create-route` command as shown in this example:

```
$ cf create-route shared-domain.example.com --hostname example-app
Creating route example-app.shared-domain.example.com for org example-org / space example-space as username@example.com...
OK
```



The cf CLI v7 `create-route` command does not require the space as an argument. It uses the space you are targeting.

This command instructs TAS for VMs to only route requests to apps mapped to this route for these URLs:

- `http://example-app.shared-domain.example.com`
- `https://example-app.shared-domain.example.com`
- Any path under either of the these URLs, such as `http://example-app.shared-domain.example.com/bar`

### Create an HTTP route without host name

This approach creates a route with the same address as the domain itself and is permitted for private domains only. For more information, see [Private Domains](#).

A developer can create a route from the domain `private-domain.example.com` with no host name with the `cf create-route` command:

```
$ cf create-route private-domain.example.com
Creating route private-domain.example.com for org example-org / space example-space as username@example.com...
OK
```

If DNS is configured correctly, this command instructs TAS for VMs to route requests to apps mapped to this route from these URLs:

- `http://private-domain.example.com`
- `https://private-domain.example.com`
- Any path under either of these URLs, such as `http://private-domain.example.com/foo`

If there are no other routes for the domain, requests to any subdomain, such as `http://foo.private-domain.example.com`, fail.

A developer can also create routes for subdomains with no host names. The following command creates a route from the subdomain `foo.private-domain.example.com`:

```
$ cf create-route foo.private-domain.example.com
Creating route foo.private-domain.example.com for org example-org / space example-space as username@example.com...
OK
```

If DNS is configured for this subdomain, this command instructs TAS for VMs to route requests to apps mapped to this route from these URLs:

- `http://foo.private-domain.example.com`
- `https://foo.private-domain.example.com`
- Any path under either of these URLs, such as `http://foo.private-domain.example.com/foo`

#### Create an HTTP route with wildcard host name

An app mapped to a wildcard route acts as a fallback app for route requests if the requested route does not exist. To create a wildcard route, use an asterisk for the host name.

A developer can create a wildcard route from the domain `foo.shared-domain.example.com` by running:

```
$ cf create-route foo.shared-domain.example.com --hostname '*'
Creating route *.foo.shared-domain.example.com for org example-org / space example-space as username@example.com...
OK
```

If a client sends a request to `http://app.foo.shared-domain.example.com` by accident, attempting to reach `example-app.foo.shared-domain.example.com`, TAS for VMs routes the request to the app mapped to the route `*.foo.shared-domain.example.com`.

#### Create an HTTP route with a path

Developers can use paths to route requests for the same host name and domain to different apps.

A developer can create three routes using the same host name and domain in the space `example-space` by running:

```
$ cf create-route shared-domain.example.com --hostname store --path products
Creating route store.shared-domain.example.com/products for org example-org / space example-space as username@example.com...
OK
```

```
$ cf create-route shared-domain.example.com --hostname store --path orders
Creating route store.shared-domain.example.com/orders for org example-org / space example-space as username@example.com...
OK
```

```
$ cf create-route shared-domain.example.com --hostname store
Creating route store.shared-domain.example.com for org example-org / space ex
```

```
ample-space as user@example.com...
OK
```

The developer can then map the new routes to different apps by following the procedure in [Map a route to your app](#).

If the developer maps the first route with path `products` to the `products` app, the second route with path `orders` to the `orders` app, and the last route to the `storefront` app. After this:

- TAS for VMs routes requests to `http://store.shared-domain.example.com/products` to the `products` app.
- TAS for VMs routes requests to `http://store.shared-domain.example.com/orders` to the `orders` app.
- TAS for VMs routes requests to `http://store.shared-domain.example.com` to the `storefront` app.

TAS for VMs attempts to match routes with a path, and then attempts to match host and domain.



- Routes with the same domain and host name but different paths can only be created in the same space. Private domains do not have this limitation.
- TAS for VMs does not route requests for context paths to the root context of an app. Apps must serve requests on the context path.

## Create a TCP route with a port

A developer can create a TCP route for `tcp.shared-domain.example.com` on an arbitrary port. This is the default in the v7 version of the cf CLI.

- An arbitrary (random) port is the default. The `--random-port` flag is not supported.

```
$ cf create-route example-space tcp.shared-domain.example.com --random-port
Creating route tcp.shared-domain.example.com for org example-org / space example-space as user@example.com...
OK
Route tcp.shared-domain.example.com:60034 has been created
```

In this example, TAS for VMs routes requests to `tcp.shared-domain.example.com:60034` to apps mapped to this route.

To request a specific port, a developer can use the `--port` flag, so long as the port is not reserved for another space. To create a TCP route for `tcp.shared-domain.example.com` on port 60035, run:

```
$ cf create-route example-space tcp.shared-domain.example.com --port 60035
Creating route tcp.shared-domain.example.com:60035 for org example-org / space example-space as user@example.com...
OK
```

## List routes

Developers can list routes for the current space with the `cf routes` command. A route is uniquely identified by the combination of hostname, domain, and path. Note that, as of cf CLI v7, `port` no longer appears in the table.

```
$ cf routes
Getting routes as user@private-domain.example.com ...

space          host           domain           port   path
type   apps
example-space  example-app   shared-domain.example.com
example-app
example-space  example-app   private-domain.example.com
example-app
example-space  store         shared-domain.example.com   /product
s           products
example-space  store         shared-domain.example.com   /orders
orders
example-space  store         shared-domain.example.com
storefront
example-space
tcp      tcp-app               shared-domain.example.com 60000
```

Developers can only see routes in spaces where they are a member. Note that cf CLI v7 removes the `port` and `path` columns from the output.

## View a route

Developers can view a route and its destinations within the current space with the `cf route` command. A route is uniquely identified by the combination of a host name, domain, port, and path. Note that the `cf route` command is available in cf CLI v8 only.

```
$ cf route shared-domain.example.com --hostname example-app
Showing route example-app.shared-domain.example.com in org o / space example-
space as admin...

domain:      shared-domain.example.com
host:        example-app
port:
path:
protocol:    http

Destinations:
      app      process     port     protocol
      mystore  web        8080    http1
```

Developers can only view a route within a space where they are a member.

## Check routes

Developers cannot create a route that is already taken. To find out if a route is available, developers can use the `cf check-route` command.

To find out if a route with the host name `store` and the domain `shared-domain.example.com` and the path `products` exists, run:

```
$ cf check-route shared-domain.example.com --hostname store --path /products
Checking for route...
OK
Route store.shared-domain.example.com/products does exist
```

## Map a route to your app

For an app to receive requests to a route, developers must map the route to the app with the `cf map-route` command. If the route does not already exist, this command creates it.

Any app that is not routed to port `80` or port `443` must be explicitly mapped using the `cf map-route` command. Otherwise, the route is mapped to port `443`.

You can create and reserve routes for later use by following the procedure in [Manually map a route](#). You can also map routes to their app immediately as part of a push. See [Map a route with app push](#).

Changes to route mappings are run asynchronously. On startup, an app becomes accessible at its route within a few seconds. Similarly, upon mapping a new route to a running app, the app becomes accessible at this route within a few seconds of the CLI exiting.

### Manually map a route

For these routes and apps:

Route	Apps
store.shared-domain.example.com/products	products
store.shared-domain.example.com/orders	orders
store.shared-domain.example.com	storefront
tcp.shared-domain.example.com:60000	tcp-app

The following commands map the routes in the table to their respective apps. Developers use host name, domain, and path to uniquely identify a route to which to map their apps.

```
$ cf map-route products shared-domain.example.com --hostname store --path products
$ cf map-route orders shared-domain.example.com --hostname store --path orders
$ cf map-route storefront shared-domain.example.com --hostname store
$ cf map-route tcp-app tcp.shared-domain.example.com --port 60000
```

The following command maps the wildcard route `*.foo.shared-domain.example.com` to the app `myfallbackapp`.

```
$ cf map-route myfallbackapp foo.shared-domain.example.com --hostname '*'
```

In cf CLI v8, the following command maps the route `h2app.shared-domain.example.com` as an HTTP/2 route to the HTTP/2 app `h2app`.

```
$ cf map-route h2app shared-domain.example.com --hostname h2app --destination -protocol http2
```

### Map a route with app push

Developers can map a route to their app with the `cf push` command. As of cf CLI v7, the best way to do this is by using the `routes` property in the manifest.

```
$ cf push example-app
```

To customize the route during `push`, specify the domain using the `-d` flag and the host name with the `--hostname` flag. The following command creates the `foo.private-domain.example.com` route for `example-app`:

```
$ cf push example-app -d private-domain.example.com --hostname foo
```

To map a TCP route during `push`, specify a TCP domain and request a random port using `--random-route`. To specify a port, push the app without a route, then create and map the route manually by following the procedure in [Create a TCP route with a port](#).

```
$ cf push tcp-app -d tcp.shared-domain.example.com --random-route
```

### Map a route using app manifest

Developers can map a route to their app with a manifest by editing the `route` attribute to specify the host, domain, port, and path components of the route. For more information, see [Deploying with app manifests](#).

### Map a route to multiple apps

TAS for VMs allows multiple apps, or versions of the same app, to be mapped to the same route. This feature activates blue-green deployment. For more information see [Using blue-green deployment to reduce downtime and risk](#).

Routing multiple apps to the same route might cause undesirable behavior in some situations by routing incoming requests randomly to one of the apps on the shared route.

For more information about troubleshooting this problem, see [Routing conflict](#) in [Troubleshooting app deployment and health](#).

### Map multiple routes to one app

You can have multiple routes to an app, but those routes cannot have different context paths.

These routes are valid for a single app:

Route 1	Route 2
<code>example-app.example.com</code>	<code>example-app.apps.cf.example.com</code>

Route 1	Route 2
example-app.example.com/foo	example-app.apps.cf.example.com/foo

These routes are *not* valid for a single app:

Route 1	Route 2
example-app.example.com/foo	example-app.apps.cf.example.com/bar
example-app.apps.cf.example.com/foo	example-app.example.com/bar

## Map an internal route to an app

You can map an internal route to any app. This internal route allows your app to communicate with other apps without leaving the platform. After it is mapped, this route becomes available to all other apps on the platform.

This example creates a `foo.apps.internal` internal route for `example-app`:

```
$ cf map-route example-app apps.internal --hostname foo
```

## Unmap a route

Developers can remove a route from an app using the `cf unmap-route` command. The route remains reserved for later use in the space where it was created until the route is deleted.

To unmap an HTTP route from an app, identify the route using the host name, domain, and path:

```
$ cf unmap-route tcp-app private-domain.example.com --hostname example-app --path mypath
```

To unmap a TCP route from an app, identify the route using the domain and port:

```
$ cf unmap-route tcp-app tcp.shared-domain.example.com --port 60000
```

## Share a route with another space

To follow the procedure in this section, you must use cf CLI v8.5.0 or later. To download cf CLI v8.5.0 or later, see the [Cloud Foundry CLI repository](#) on GitHub.

You can share a route with another space using the `cf share-route` command. To move an app to another space, you can share routes with that space to prevent downtime during the transition. Rather than deleting the route in the original space and re-creating the route in the new space, you can share the route with the new space and map it to the app running in that space.

To share a route with another space:

1. In a terminal window, allow route sharing by running:

```
cf enable-feature-flag route_sharing
```

2. Run:

```
cf share-route DOMAIN --hostname HOSTNAME --path PATH -s SPACE -o ORG
```

Where:

- **DOMAIN** is the domain in the route for your app.
- **HOSTNAME** is the host name in the route for your app.
- **PATH** is the path in the route for your app.
- **SPACE** is the space with which you want to share the route for your app.
- **ORG** is the org containing space with which you want to share the route for your app. If the space with which you want to share the route is within the same org as the space that contains the route, do not include the **-o** flag.

The following example command shares the route `example-app.example.com/example-path` with the `other-space` space in the `other-org` org:

```
cf share-route example.com --hostname example-app --path example-path -s other-space -o other-org
```

## Transfer ownership of a route to another space



To follow the procedure in this section, you must use cf CLI v8.5.0 or later. To download cf CLI v8.5.0 or later, see the [Cloud Foundry CLI repository](#) on GitHub.

After sharing a route with another space, you can transfer ownership of the route to that space using the `cf move-route` command. You can use this command if you are unable to maintain or delete a shared route within the space with which it was shared. For information about sharing routes across spaces, see [Share a route with another space](#).

To move a route:

1. In a terminal window, target the space from which the route was originally shared by running:

```
cf target -s SPACE -o ORG
```

Where:

- **SPACE** is the space from which the route was originally shared.
- **ORG** is the org containing space from which the route was originally shared. If the space from which the route was originally shared is within the same org as the space with which the route was shared, do not include the **-o** flag.

2. Run:

```
cf move-route DOMAIN --hostname HOSTNAME --path PATH -s SPACE -o ORG
```

Where:

- **DOMAIN** is the domain in the route for your app.

- `HOSTNAME` is the host name in the route for your app.
- `PATH` is the path in the route for your app.
- `SPACE` is the space to which you want to move the route for your app.
- `ORG` is the org containing space to which you want to move the route for your app. If the space to which you want to move the route is within the same org as the space that contains the route, do not include the `-o` flag.

The following example command moves the route `example-app.example.com/example-path` with the `other-space` space in the `other-org` org:

```
cf move-route example.com --hostname example-app --path example-path -s other-space -o other-org
```

## Delete a route

Developers can delete a route from a space using the `cf delete-route` command.

To delete a HTTP route, identify the route using the host name, domain, and path:

```
$ cf delete-route private-domain.example.com --hostname example-app --path my path
```

To delete a TCP route, identify the route using the domain and port.

```
$ cf delete-route tcp.private-domain.example.com --port 60000
```

## Routing requests to a specific app instance

Users can route HTTP requests to a specific app instance using the header `X-Cf-App-Instance`.



Use of the `X-Cf-App-Instance` header is available only for users on the Diego architecture.

The format of the header is `X-Cf-App-Instance: APP_GUID:APP_INDEX`.

`APP_GUID` is an internal identifier for your app. Use the `cf APP-NAME --guid` command to discover the `APP_GUID` for your app.

```
$ cf app example-app --guid
```

`APP_INDEX`, for example, `0`, `1`, `2`, or `3`, is an identifier for a particular app instance. Use the CLI command `cf app APP-NAME` to get statistics on each instance of a particular app.

```
$ cf app example-app
```

The following example shows a request made to instance `9` of an app with GUID `5cdc7595-2e9b-4f62-8d5a-a86b92f2df0e` and mapped to route `example-app.private-domain.example.com`.

```
$ curl example-app.private-domain.example.com -H "X-Cf-App-Instance: 5cdc7595-2e9b-4f62-8d5a-a86b92f2df0e:9"
```

If the `X-Cf-App-Instance` header is set to an invalid value, Gorouter returns a `400` status code and the response from Gorouter contains a `X-Cf-Routererror` header with more information about the error. Before the routing release v0.197.0, Gorouter returned a `404` error.

These are the possible error responses:

<b>X-Cf-Routererror value</b>	<b>Reason for error</b>	<b>Response body</b>
<code>invalid_cf_app_instance_header</code>	The value provided for <code>X-Cf-App-Instance</code> was an incorrectly formatted GUID.	None
<code>unknown_route</code>	The value provided for <code>X-Cf-App-Instance</code> is a correctly formatted GUID, but no instance is found with that GUID for the route requested.	<code>400 Bad Request: Requested instance ('1') with guid ('aaaaaaaaaaaa-aaaa-aaaa-aaaaaaaaaaaaaa') does not exist for route ('example-route.cf.com')</code>

## Domains

The term *domain* here differs from its common use and is specific to TAS for VMs. Likewise, shared domain and private domain refer to resources with specific meaning in TAS for VMs. The use of *domain name*, *root domain*, and *subdomain* refers to DNS records.

Domains indicate to a developer that requests for any route created from the domain are routed to TAS for VMs. This requires DNS to be configured out-of-band to resolve the domain name to the IP address of a load balancer configured to forward requests to the TAS for VMs routers. For more information about configuring DNS, see [DNS for domains](#).

### List domains for an org

When creating a route, developers select from domains available to them. Use the `cf domains` command to view a list of available domains for the targeted org:

```
$ cf domains
Getting domains in org example-org as user@example.com... OK
name          status   type
shared-domain.example.com    shared
tcp.shared-domain.example.com  shared   tcp
private-domain.example.com    owned
```

This example displays three available domains: a shared HTTP domain `shared-domain.example.com`, a shared TCP domain `tcp.shared-domain.example.com`, and a private domain `private-domain.example.com`. For more information, see [Shared domains](#) and [Private domains](#).

### HTTP versus TCP domains

By default, TAS for VMs only supports routing of HTTP requests to apps. HTTP domains indicate to a developer that only requests using the HTTP protocol are routed to apps mapped to routes created from the

domain. Routing for HTTP domains is layer 7 and offers features like custom host names, sticky sessions, and TLS termination.

TCP domains indicate to a developer that requests over any TCP protocol, including HTTP, are routed to apps mapped to routes created from the domain. Routing for TCP domains is layer 4 and protocol-agnostic, so many features available to HTTP routing are not available for TCP routing. TCP domains are defined as being associated with the TCP router group. The TCP router group defines the range of ports available to be reserved with TCP routes. Only shared domains can use a TCP protocol.

## Shared domains

Admins manage shared domains, which are available to users in all orgs of a TAS for VMs deployment. An admin can offer multiple shared domains to users. For example, an admin might offer developers the choice of creating routes for their apps from `shared-domain.example.com` and `cf.example-company.com`.

If a developer pushes an app without specifying a domain, a route is created for it from the first shared domain created in the system. All other operations involving route require the domain be specified. For more information, see [Routes](#).

When using shared domains, you cannot have routes with the same host name and domain across different orgs and spaces.

Shared domains are HTTP by default, but can be configured to be TCP when associated with the TCP router group.

### Create a shared domain

Admins can create an HTTP shared domain with the `cf create-shared-domain` command:

```
$ cf create-shared-domain shared-domain.example.com
```

To create a TCP shared domain, first discover the name of the TCP router group.



cf CLI v7 does not support TCP routing or creating shared domains with router groups.

```
$ cf router-groups
Getting router groups as admin ...
name      type
default-tcp  tcp
```

Then create the shared domain using the `--router-group` option to associate the domain with the TCP router group.

```
$ cf create-shared-domain tcp.shared-domain.example.com --router-group default-tcp
```

### Delete a shared domain

Admins can delete a shared domain from TAS for VMs with the `cf delete-shared-domain` command:

```
$ cf delete-shared-domain example.com
```

## Internal domain

The internal domain is a special type of shared domain used for app communication internal to the platform. When you activate service discovery, the internal domain `apps.internal` becomes available for route mapping.

Admins can configure multiple internal domains. Add a custom internal domain name to the `internal_domains` property on the `bosh-dns-adapter` job. Then create an internal domain using the `--internal` option:

```
$ cf create-shared-domain shared-domain.example.com --internal
```

The `--router-group` option is not used with internal domains.

## Private domains

Org managers can add private domains, or custom domains, and give members of the org permission to create routes for privately registered domain names.

Private domains can be shared with other orgs and spaces. These are called as shared private domains and are not the same as shared domains. For more information, see [Shared domains](#).

When using private domains, you can have routes with the same host name and domain name across different orgs and spaces. This cannot be done with shared domains.

Private domains can be HTTP or HTTPS only. TCP routing is supported for shared domains only.

### Create a private domain

Org managers can create a private domain by running:

```
$ cf create-private-domain example-org private-domain.example.com
```

Org managers can create a private domain for a subdomain by running:

```
$ cf create-private-domain example-org foo.private-domain.example.com
```

### Sharing a private domain with one or more orgs

Org managers can grant or revoke access to a private domain to other orgs if they have permissions for these orgs. As of cf CLI v7, `cf unshare-private-domain` command provides a warning and requires confirmation before it proceeds.

```
$ cf share-private-domain test-org private-domain.example.com
```

```
$ cf unshare-private-domain test-org private-domain.example.com
```

### Delete a private domain

Org managers can delete a domain from TAS for VMs with the `cf delete-domain` command:

```
$ cf delete-private-domain private-domain.example.com
```



cf CLI v7 renames the `delete-domain` command to `delete-private-domain`.

## Requirements for parent and child domains

In the domain `example-app.shared-domain.example.com`, `shared-domain.example.com` is the parent domain of subdomain `example-app`. The following list describes requirements for creating domains:

- You can only create a private domain that is parent to a private subdomain.
- You can create a shared domain that is parent to either a shared or a private subdomain.

The domain `foo.example-app.shared-domain.example.com` is the child subdomain of `example-app.shared-domain.example.com`. The following list describes requirements for creating subdomains:

- You can create a private subdomain for a private parent domain only if the domains belong to the same org.
- You can create a private subdomain for a shared parent domain.
- You can only create a shared subdomain for a shared parent domain.
- You cannot create a shared subdomain for a private parent domain.

## DNS for domains

To create customized access to your apps, you can map specific or wildcard custom domains to TAS for VMs by using your DNS provider.

### Mapping Domains to your custom domain

To associate a registered domain name with a domain on TAS for VMs, configure a CNAME record with your DNS provider, pointing at any shared domain offered in TAS for VMs.

### Mapping a single domain to your custom domain

To map a single domain to a custom domain to TAS for VMs, configure a CNAME record with your DNS provider.

Here are some example CNAME record mappings.

Record set in custom domain	Type	Target in TAS for VMs
example-app.yourcustomdomain.com.	CNAME	example-app.shared-domain.example.com
www.yourcustomdomain.com.	CNAME	example-app.shared-domain.example.com

After you create the CNAME mapping, your DNS provider routes your custom domain to `example-app.shared-domain.example.com`. See your DNS provider documentation to find out if the trailing `.` is required.

### Mapping multiple subdomains to your custom domain

Use a wildcard CNAME record to point all of the subdomains in your custom domain to shared-domain.example.com.

Each separately configured subdomain has priority over the wildcard configuration.

Here are some example wildcard CNAME record mappings.

Record set in custom domain	Type	Target in TAS for VMs
*.yourcustomdomain.com.	CNAME	*.shared-domain.example.com
*.yourcustomdomain.com.	CNAME	*.example-app.shared-domain.example.com

If you use a wildcard as the subdomain name, then your DNS provider can route from \*.`YOURCUSTOMDOMAIN` to any of the following:

- \*.shared-domain.example.com
- foo.example-app.shared-domain.example.com
- bar.foo.example-app.shared-domain.example.com

### Configuring DNS for your registered root domain

To use your root domain for apps on TAS for VMs, you can use custom DNS record types like ALIAS and ANAME, if your DNS provider offers them, or you can use subdomain redirection.



Root domains are also called zone apex domains.

If your DNS provider supports using an ALIAS or ANAME record, configure your root domain with your DNS provider to point at a shared domain in TAS for VMs.

Record	Name	Target	Note
ALIAS or ANAME	empty or @	private-domain.example.com.	To decide whether to use an empty or @ value for the Name entry, see the documentation for your DNS provider.

If your DNS provider does not support ANAME or ALIAS records, you can use subdomain redirection, also known as domain forwarding, to redirect requests for your root domain to a subdomain configured as a CNAME.



If you use domain forwarding, SSL requests to the root domain might fail if the SSL certificate matches only the subdomain. For more information about SSL certificates, see the [Cloud Foundry documentation](#).

Configure the root domain to point at a subdomain such as `www`, and configure the subdomain as a CNAME record pointing at a shared domain in TAS for VMs.

Record	Name	Target	Note
URL or Forward	private-domain.example.com	www.private-domain.example.com	This method causes a <code>301 permanent redirect</code> to the subdomain you configure.

Record	Name	Target	Note
CNAME	www	example-app.shared-domain.example.com	

## Configuring per-route options

By default, communication between Gorouter and backends is configured via general settings at the platform level.

This topic describes how to specify per-route Gorouter options scoped at the application level. This greater granularity lets developers tailor optimal routing behavior for applications' unique load profiles or other requirements.

Gorouter supports the following per-route option, described in the section below:

- `loadbalancing`: Configures the load balancing algorithm used by Gorouter for this particular route. Available from cf-deployment v46.7.0 and later.
  - Settings: `round-robin`, `least-connections`.

## loadbalancing: Configure Gorouter's Load Balancing Algorithm

Available from cf-deployment v46.7.0 and later.

The per-route option `loadbalancing` allows configuring the load balancing algorithm, which defines how the load is distributed between Gorouters and backends.

This option supports two settings for load balancing:

- `round-robin` distributes the load evenly across all available backends
- `least-connections` directs traffic to the backend with the fewest active connections at any given time, optimizing resource utilization

## Configure Load Balancing in an App Manifest

To configure per-route load balancing for an application that has not yet been pushed:

1. In the application manifest, include a `route` definition with an `options: loadbalancing` attribute set to `round-robin` or `least-connections`. For example:

```
---  
applications:  
- name: MY-APP  
  routes:  
    - route: MY-APP.EXAMPLE.COM  
      options:  
        loadbalancing: least-connections
```

Where `MY-APP` is the name of your app and `MY-APP.EXAMPLE.COM` is the route you want to map to your app.

2. Push the app with the manifest:

```
cf push -f manifest.yml
```

- To confirm the setting, query the `routes` API endpoint for the app's route:

```
cf curl /v3/routes/?hosts=MY-APP
```

Where `MY-APP` is the host attribute of the route. The response lists the chosen `loadbalancing` algorithm setting:

```
"options": {
  "loadbalancing": "least-connections"
}
```

## Change Load Balancing of an Existing App

To change the per-route `loadbalancing` setting of an app that has already been pushed, `cf curl` the `/v3/routes` API. For example, to change an app route's algorithm from `least-connections` to `round-robin`:

- Execute a `PATCH` request to the targeted API endpoint:

```
cf curl /v3/routes/GUID -X PATCH -H "Content-type: application/json" \
-d '{
  "options": {
    "loadbalancing": "round-robin"
  }
}'
```

Where `GUID` is the unique identifier for the route.

- To confirm the setting, query the `routes` API endpoint for the route:

```
cf curl /v3/routes/GUID
```

Where `GUID` is the unique identifier for the route. The response lists the new `round-robin` setting:

```
"options": {
  "loadbalancing": "round-robin"
}
```

## Routing HTTP/2 and gRPC traffic to apps

Here are instructions for routing HTTP/2 and gRPC traffic to VMware Tanzu Application Service for VMs (TAS for VMs) apps. HTTP/2 is the second major version of the the HTTP protocol. In TAS for VMs v2.12 and later, HTTP/2 support is enabled by default.

For more information about the HTTP/2 protocol, see [RFC 7540](#).

gRPC is a Remote Procedure Call (RPC) framework that uses HTTP/2 as its transport medium. It is especially useful for managing communication between apps in a microservices cluster. For apps to serve gRPC traffic, every network hop between the client and app must use HTTP/2.

For more information, see [gRPC](#).

## Performance

HTTP/2 can provide performance improvements for apps that are built to:

- Load many resources in parallel. For example, an HTML page that loads many images or JavaScript files.
- Use large and repetitive headers.

Other apps might see minimal or no performance increases. Experiment with your app to see how serving HTTP/2 affects its performance.

For an example of an app that benefits from HTTP/2, see the [Cloud Foundry HTTP/2 Tile Demo App](#).

## Limitations

HTTP/2 support in TAS for VMs has these limitations:

- End-to-end HTTP/2 is not available for Windows Diego Cells. Routes with HTTP/2 mappings continue to send HTTP/1.1 traffic to apps that run on Windows Diego Cells.
- Routes that have route services bound to them might not support end-to-end HTTP/2 depending on what protocols the bound service supports. For more information, see [Route services](#).

## How pushing apps with HTTP/2 works

If your TAS for VMs deployment is configured to support HTTP/2, then all traffic coming in to TAS for VMs supports HTTP/2. The traffic is forwarded as HTTP/1.1 before it reaches your app unless configured otherwise.

For more information, see [Configuring HTTP/2 support](#).

To serve gRPC traffic, your app must use HTTP/2 for all network hops. Configure your route to send HTTP/2 traffic to your app. When configured, traffic that matches the route is always sent to your app over HTTP/2 regardless of the original ingress protocol.

For example, external HTTP/1.1 requests are forwarded to your app over HTTP/2. Your app does not have the opportunity to negotiate what protocol it receives.

If a client is familiar with the HTTP/2 specification, your app receives HTTP/2 with prior knowledge. For more information, see [Starting HTTP/2 with Prior Knowledge](#) in *RFC 7540: Hypertext Transfer Protocol Version 2 (HTTP/2)*.

## Push apps with HTTP/2 support

This section describes how to push TAS for VMs apps with support for HTTP/2.

You do not need to make changes to existing apps to support HTTP/2. For information about pushing an HTTP/1.1 app that serves HTTP/2 traffic, see [Push an HTTP/1.1 App that Serves HTTP/2](#).

There are multiple ways to push an app with end-to-end HTTP/2. You can push the app using either the app manifest or the Cloud Foundry Command Line Interface (cf CLI). You can also use either method to push an app that serves gRPC traffic.

To push an app with end-to-end HTTP/2, see:

- Push an app with end-to-end HTTP/2 using the app manifest
- Push an app with end-to-end HTTP/2 using the cf CLI
- Push a gRPC app

## Push an HTTP/1.1 app that serves HTTP/2

To push an HTTP/1.1 app that can serve HTTP/2 traffic:

1. Push the HTTP/1.1 app by running:

```
cf push MY-APP
```

Where `MY-APP` is the name of your app.

2. Send an HTTP/2 request to the app by running:

```
curl MY-APP.EXAMPLE.COM --http2 -v
```

Where `MY-APP.EXAMPLE.COM` is the route mapped to your app.

The request and response are both issued over HTTP/2.



To issue this request, you must use a version of `curl` that supports HTTP/2.

3. Review the app logs by running:

```
cf logs MY-APP
```

The request to the app is issued over HTTP/1.1.

## Push an app with end-to-end HTTP/2 using the app manifest

To push an app that serves HTTP/2 traffic using the app manifest:

1. Use an app that supports serving HTTP/2 traffic with prior knowledge. For example, you can use the HTTP/2 test app from [Cloud Foundry Acceptance Tests](#) on GitHub.
2. Create an app manifest named `manifest.yml` with a route mapped to the app with HTTP/2:

```
---
applications:
- name: MY-APP
  routes:
    - route: MY-APP.EXAMPLE.COM
      protocol: http2
```

Where `MY-APP` is the name of your app and `MY-APP.EXAMPLE.COM` is the route you want to map to your app.

3. Push the app with the manifest by running:

```
cf push -f manifest.yml
```

- Send an HTTP/2 request to the app by running:

```
curl MY-APP.EXAMPLE.COM --http2 -v
```

The request and response are both sent over HTTP/2. The response from the test app includes the protocol.

For example:

```
Hello, /, TLS: false, Protocol: HTTP/2.0
```

The response shows that the request was received over HTTP/2.

## Push an app with end-to-end HTTP/2 using the cf CLI

The recommended way to do this is using the `routes` attribute in the manifest YAML file.



The following procedure is supported only for cf CLI v6. The `--hostname` flag is deprecated in cf CLI v7, and must be specified in the manifest.

To push an app that serves HTTP/2 traffic using the cf CLI (v6 only):

- Use an app that supports serving HTTP/2 traffic with prior knowledge. For example, you can use the HTTP/2 test app from [Cloud Foundry Acceptance Tests](#) on GitHub.
- Push the app without a default route by running with the `--no-route` flag. Note that this flag is no longer unbinds all existing routes associated with the app.

```
cf push --no-route
```

- You can map a route by running:

```
cf map-route MY-APP EXAMPLE.COM --hostname host
```

Where `MY-APP` is the name of your app and `EXAMPLE.COM` is the route you want to map to your app.

- Send an HTTP/2 request to the app by running:

```
curl HOST.EXAMPLE.COM --http2 -v
```

The request and response are both sent over HTTP/2. The response from the test app includes the protocol.

For example:

```
Hello, /, TLS: false, Protocol: HTTP/2.0
```

The response shows that the request was received over HTTP/2.

## Push a gRPC app

To push an app that serves gRPC traffic:

1. Use an app that supports serving gRPC traffic. For example, you can use the gRPC test app from [Cloud Foundry Acceptance Tests](#) on GitHub.
2. Push the app with HTTP/2 activated using either the app manifest or the cf CLI. See [Push an app with end-to-end HTTP/2 using the app manifest](#) or [Push an app with end-to-end HTTP/2 using the cf CLI](#).
3. Send a gRPC request to the app using `grpcurl` by running the following command. For more information, see [grpcurl](#).

```
grpcurl -vv -import-path ./test/ -proto test.proto MY-APP.EXAMPLE.COM:443 test.  
Test.Run
```

Where `MY-APP.EXAMPLE.COM` is the route to your app.

A successful response looks like this:

```
Response contents:  
{  
  "body": "Hello"  
}
```

## Sample applications

Here are some sample HTTP/2 and gRPC applications from the community. You can use them to experiment with HTTP/2 and provide code examples for different languages and frameworks.

- [ASP.NET Core HTTP/2 App](#)
- [Golang CATs gRPC App](#)
- [Golang CATs HTTP/2 App](#)
- [Golang HTTP/2 Tile App](#)
- [Golang SAP gRPC App](#)
- [Golang SAP HTTP/2 App](#)
- [Java SAP gRPC App](#)
- [Java SAP HTTP/2 App](#)
- [Node SAP gRPC App](#)
- [Node SAP HTTP/2 App](#)
- [Python SAP gRPC App](#)
- [Python SAP HTTP/2 App](#)
- [Ruby SAP gRPC App](#)
- [Ruby SAP HTTP/2 App](#)

## Configuring TAS for VMs to Route Traffic to Apps on Custom Ports

By default, apps only receive requests on port `8080` for both HTTP and TCP routing. Configuring custom app ports allows developers to bring workloads onto TAS for VMs that receive requests on ports other than `8080`. Here are some example use cases:

- Serving web client requests on one port, and stats and debugging on another
- Using TCP protocols that require multiple ports
- Running Docker images on TAS for VMs

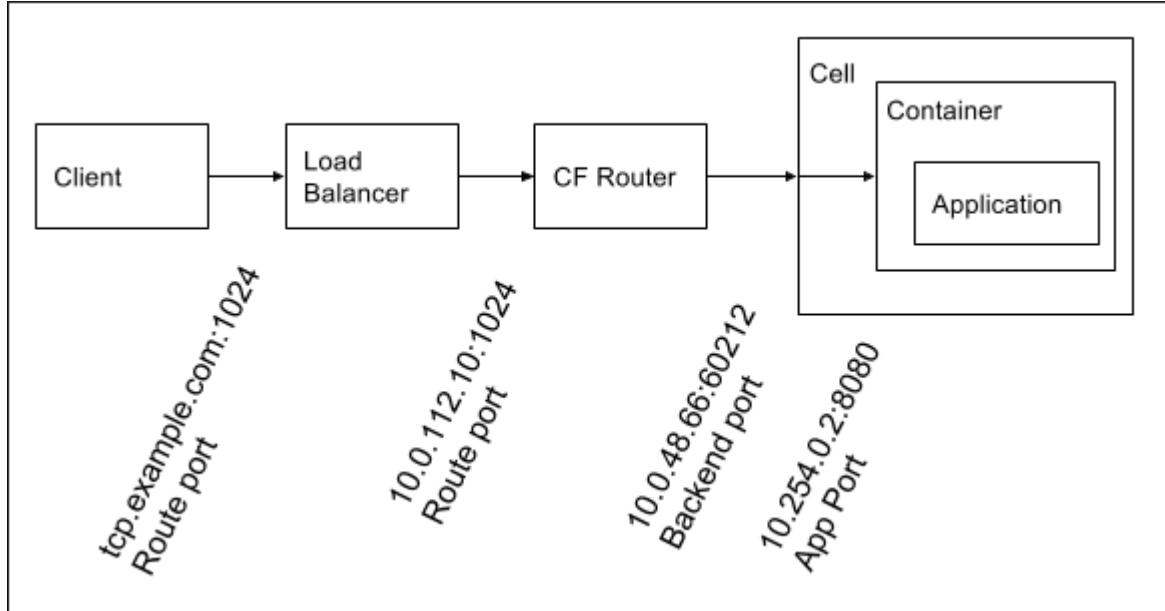
To use the `apps` and `route_mappings` Cloud Controller API endpoints to update the ports so the the app can receive requests, see [Procedure](#).

## Flow of a request to an app

The table describes the Network Address Translation that occurs in the data path of a client request:

Port Type	Description	Network Hop
Route port	The port to which a client sends a request	Client to load balancer, load balancer to Gorouter
Back end port	The port on the VM where an application container is hosted, which is unique to the container	Gorouter to Diego Cell
App port	The port on the container, which must match a port on which the app is configured to receive requests	Diego Cell to application container

The following diagram shows an example data path and Network Address Translation for TCP routing:



For HTTP routing, the route port is always `80` or `443`.

## Prerequisites

Before you follow the procedure to configure routing to your app on custom ports, you must have:

- An app pushed to TAS for VMs that can receive requests on one or more custom ports.

- Routes for which you want traffic forwarded to your app on custom ports, which are mapped to the app.

If your app receives requests on two ports, and you want clients to be able to send requests to both of them, create two routes. These routes can be from HTTP or TCP domains.

## Procedure

In the following procedure, use API endpoints to map the routes to your app on the ports it uses to receive requests. For more information about routes, see [Routes and Domains](#).

To configure your app to receive HTTP or TCP requests on custom ports:

1. Run:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. From the output, record:

- Under `guid`, the global unique identifier (GUID) of your app.
- Under `type`, the process type your app uses.

3. Retrieve the GUIDs of the routes for your app by running one of these commands, depending on whether your app uses HTTP or TCP routes:

- For HTTP routes, run:

```
cf curl /v3/apps/APP-GUID/routes?hosts=ROUTE-HOSTNAME
```

Where:

- `APP-GUID` is the GUID of your app that you recorded in an earlier step.
- `ROUTE-HOSTNAME` is the subdomain of the domain associated with the route. For example, in the route `example-app.shared-domain.example.com`, the host name is `example-app`.

- For TCP routes, run:

```
cf curl /v3/apps/APP-GUID/routes?port=PORT
```

Where:

- `APP-GUID` is the GUID of your app that you recorded in an earlier step.
- `PORT` is the port to which the TCP route sends requests.

4. From the output, record the GUIDs of the routes for your app.
5. For each route, update the ports to which it sends requests by running:

```
cf curl -X PATCH /v3/routes/ROUTE-GUID/destinations -d '{
  "destinations": [
    {
      "app": {
```

```

        "guid": "APP-GUID",
        "process": {
            "type": "PROCESS-TYPE"
        },
        "port": PORT,
        "protocol": "PROTOCOL"
    }
]
}

```

Where:

- `APP-GUID` is the GUID of your app that you recorded in an earlier step.
- `ROUTE-GUID` is the GUID of a route that you recorded in an earlier step.
- `PORT` is a custom port on which your app is configured to receive requests.
- `PROTOCOL` is the protocol that the route uses. For HTTP routes, this value is either `http1` or `http2`. For TCP routes, this value is `tcp`.
- `PROCESS-TYPE` is the value of `type` that you recorded in an earlier step. This value is usually `web`.



This API call removes all destinations for a route and replaces them with the destinations you provide in the API request.

## Additional resources

- For more information about making requests to the Cloud Controller API (CAPI) `apps` endpoints, see the [CAPI V3 documentation](#).

## Managing apps with the cf CLI

In this section:

- [Running tasks in your apps](#)
- [Scaling your app using Cloud Foundry CLI \(cf scale\)](#)
- [Using Cloud Foundry health checks](#)
- [Cloud Foundry API app revisions](#)
- [Configuring container-to-container networking](#)

## Running tasks in your apps

A task is an app or script, the code of which is included as part of a deployed app, but runs independently in its own container. This topic describes how to run tasks in VMware Tanzu Application Service for VMs (TAS for VMs).

## Tasks in TAS for VMs

In contrast to a long-running process (LRP), tasks run for a finite amount of time, then stop. Tasks run in their own containers and are designed to use minimal resources. After a task runs, TAS for VMs destroys the container running the task.

As a single use object, a task can be checked for its state and for a success or failure message.



Running a task consumes an app instance and is billed accordingly.

## Use cases for tasks

Tasks are used to perform one-off jobs, which include:

- Migrating a database
- Sending an email
- Running a batch job
- Running a data processing script
- Processing images
- Optimizing a search index
- Uploading data
- Backing-up data
- Downloading content

## How tasks are run

Tasks are always run asynchronously, meaning that they run independently from the parent app or other tasks that run on the same app.

The life cycle of a task is as follows:

1. A user initiates a task in TAS for VMs using one of the following mechanisms:
  - The `cf run-task APP-NAME "TASK"` command. For more information, see [Running tasks in your apps](#).
  - A Cloud Controller v3 API call. For more information, see the [Cloud Foundry API documentation](#).
  - The Cloud Foundry Java Client. For more information, see [Cloud Foundry Java Client Library](#) and the [Cloud Foundry Java Client](#) repository on GitHub.
2. TAS for VMs creates a container specifically for the task.
3. TAS for VMs runs the task on the container using the value passed to the `cf run-task` command.
4. TAS for VMs destroys the container.

The container also inherits environment variables, service bindings, and security groups bound to the app.



You cannot SSH into the container running a task.

## Task logging and execution history

Any data or messages the task outputs to stdout or stderr is available in the firehose logs of the app. A syslog drain attached to the app receives the task log output. The task execution history is retained for one month.

## Manage tasks

At the system level, a user with admin-level privileges can use the Cloud Controller v3 API to view all tasks that are running within an org or space. For more information, see the [Cloud Foundry API documentation](#).

Admins can set the default memory, disk usage and log rate quotas for tasks on a global level.

Tasks use the same memory, disk usage, and log rate limit defaults as apps, unless you customize them using the `cf run-task` command. For more information about the `cf run-task` command, enter `cf run-task --help`.

You configure the default memory, disk, and log rate allocations using the **Default app memory**, **Default disk quota per app**, and **Default log rate limit per app** fields in the **App Developer Controls** pane of the VMware Tanzu Application Service for VMs (TAS for VMs) tile.

## Run a task on an app

You can use the Cloud Foundry Command Line Interface (cf CLI) to run a task in the context of an app.



- To run tasks with the cf CLI, you must install cf CLI v6.23.0 or later, or install cf CLI v7 or v8. To download, install, and uninstall the cf CLI, see [Installing the Cloud Foundry Command Line Interface](#).
- To run a task using cf CLI v6 without starting the app, push the app with `cf push -i 0` and then run the task. You can run the app later by scaling up its instance count.

## Run a task on an app with cf CLI v6

To run a task on an app with cf CLI v6:

- In a terminal window, push your app by running:

```
cf push APP-NAME
```

Where `APP-NAME` is the name of your app,

- Run your task on the deployed app by running:

```
cf run-task APP-NAME "TASK" --name TASK-NAME
```

Where:

- `APP-NAME` is the name of your app.
- `TASK` is the task you want to run.

- **TASK-NAME** is the name you want to give the task.

The following example command runs a database migration as a task on the `example-app` app:

```
cf run-task example-app "bin/rails db:migrate" --name example-task
```

When the task runs successfully, you see an output similar to the following example:

```
Creating task for app example-app in org example-org / space development as admin@example.org...
OK
Task 1 has been submitted successfully for execution.
```



To run a task again, you must run it as a new task using the previous command.

3. To display the recent logs of the app and all its tasks, run:

```
cf logs APP-NAME --recent
```

Where `APP-NAME` is the name of your app.

If a task succeeds, you see logs similar to the following example:

```
2017-01-03T15:58:06.57-0800 [APP/TASK/my-task/0]OUT Creating container
2017-01-03T15:58:08.45-0800 [APP/TASK/my-task/0]OUT Successfully created container
2017-01-03T15:58:13.32-0800 [APP/TASK/my-task/0]OUT D, [2017-01-03T23:58:13.322258 #7] DEBUG -- : (15.9ms) CREATE TABLE "schema_migrations" ("version" character varying PRIMARY KEY)
2017-01-03T15:58:13.33-0800 [APP/TASK/my-task/0]OUT D, [2017-01-03T23:58:13.337723 #7] DEBUG -- : (11.9ms) CREATE TABLE "ar_internal_metadata" ("key" character varying PRIMARY KEY, "value" character varying, "created_at" timestamp NOT NULL, "updated_at" timestamp NOT NULL)
2017-01-03T15:58:13.34-0800 [APP/TASK/my-task/0]OUT D, [2017-01-03T23:58:13.340234 #7] DEBUG -- : (1.6ms) SELECT pg_try_advisory_lock(3720865444824511725);
2017-01-03T15:58:13.35-0800 [APP/TASK/my-task/0]OUT D, [2017-01-03T23:58:13.351853 #7] DEBUG -- : ActiveRecord::SchemaMigration Load (0.7ms) SELECT "schema_migrations".* FROM "schema_migrations"
2017-01-03T15:58:13.35-0800 [APP/TASK/my-task/0]OUT I, [2017-01-03T23:58:13.357294 #7] INFO -- : Migrating to CreateTopics (20161118225627)
2017-01-03T15:58:13.35-0800 [APP/TASK/my-task/0]OUT D, [2017-01-03T23:58:13.359565 #7] DEBUG -- : (0.5ms) BEGIN
2017-01-03T15:58:13.35-0800 [APP/TASK/my-task/0]OUT == 20161118225627 CreateTopics: migrating =====
2017-01-03T15:58:13.50-0800 [APP/TASK/my-task/0]OUT Exit status 0
2017-01-03T15:58:13.56-0800 [APP/TASK/my-task/0]OUT Destroying container
2017-01-03T15:58:15.65-0800 [APP/TASK/my-task/0]OUT Successfully destroyed container
```

If a task fails, you see logs similar to the following example:

```
2016-12-14T11:09:26.09-0800 [APP/TASK/my-task/0]OUT Creating container
2016-12-14T11:09:28.43-0800 [APP/TASK/my-task/0]OUT Successfully created container
2016-12-14T11:09:28.85-0800 [APP/TASK/my-task/0]ERR bash: bin/rails: command not found
2016-12-14T11:09:28.85-0800 [APP/TASK/my-task/0]OUT Exit status 127
2016-12-14T11:09:28.89-0800 [APP/TASK/my-task/0]OUT Destroying container
2016-12-14T11:09:30.50-0800 [APP/TASK/my-task/0]OUT Successfully destroyed container
```

If your task name is unique, you can `grep` the output of the `cf logs` command for the task name to view task-specific logs.

## Run a task on an app with cf CLI v7

To run a task on an app with cf CLI v7:

1. Configure your v3 API manifest with a task as a process type. For more information, see the [Cloud Foundry API documentation](#).
2. In a terminal, push your app by running:

```
cf push APP-NAME --task
```

Where `APP-NAME` is the name of your app.

3. Run your task on the deployed app by running:

```
cf run-task APP-NAME --name TASK-NAME
```

Where:

- `APP-NAME` is the name of your app.
- `TASK-NAME` is the name you want to give the task.



`cf run-task` allows you to include the `--process` and `--command` flags. Including the `--command` flag overrides the manifest property.

The following example command runs a task on the `example-app` app:

```
cf run-task example-app --name example-task
```

When the task runs successfully, you see terminal output similar to the following example:

```
Creating task for app example-app in org example-org / space development as admin@example.org...
OK
Task 1 has been submitted successfully for execution.
```

- To display the recent logs of the app and all its tasks, run:

```
cf logs APP-NAME --recent
```

Where `APP-NAME` is the name of your app.

## List tasks running on an app

To list the tasks for a given app:

- In a terminal window, run:

```
cf tasks APP-NAME
```

Where `APP-NAME` is the name of your app. The command returns output similar to the following example:

```
Getting tasks for app example-app in org example-org / space development as admin@example.org...
OK

id      name        state       start time           command
2      339044ef    FAILED      Wed, 23 Nov 2016 21:52:52 UTC echo foo; sleep 100; echo bar
1      8d0618cf    SUCCEEDED   Wed, 23 Nov 2016 21:37:28 UTC bin/rails db:migrate
```

Tasks can be in these states:

State	Description
RUNNING	The task is in progress.
FAILED	The task did not complete. This state occurs when a task does not work correctly or a user cancels the task.
SUCCEEDED	The task completed successfully.

## Cancel a task

After you run a task, you might be able to cancel it before it finishes.

To cancel a running task:

- In a terminal window, run:

```
cf terminate-task APP-NAME TASK-ID
```

Where:

- `APP-NAME` is the name of your app.
- `TASK-ID` is the name you want to give the task.

The previous command returns output similar to the following example:

```
Terminating task 2 of app example-app in org example-org / space development as admin@example.org...
OK
```

## Scaling your app using Cloud Foundry CLI (cf scale)

Factors such as user load, or the number and nature of tasks performed by an app, can change the disk space and memory the app uses. This topic describes how to scale an app using the Cloud Foundry Command Line Interface (cf CLI). For many apps, increasing the available disk space or memory can improve overall performance. Similarly, running additional instances of an app can allow the app to handle increases in user load and concurrent requests. These adjustments are called “scaling” an app.

Use the `cf scale` command to scale your app up or down to meet changes in traffic or demand.



You can configure your app to scale automatically based on rules that you set. For more information, see [Scaling an App Using Autoscaler](#) and [Using the App Autoscaler CLI](#).

### Scaling horizontally

Horizontally scaling an app creates or destroys instances of your app.

Incoming requests to your app are automatically load balanced across all instances of your app, and each instance handles tasks in parallel with every other instance. Adding more instances allows your app to handle increased traffic and demand.

Use `cf scale APP -i INSTANCES` to horizontally scale your app. Cloud Foundry increases or decreases the number of instances of your app to match `INSTANCES`.

```
$ cf scale myApp -i 5
```



In cf CLI v7+, you can also use `--process` with `cf scale` to scale specific processes of your app.

### Scaling vertically

Vertically scaling an app changes the disk space limit or memory limit that Cloud Foundry applies to all instances of the app.

Use `cf scale APP -k DISK` to change the disk space limit applied to all instances of your app. `DISK` must be an integer followed by either an **M**, for megabytes, or **G**, for gigabytes.

```
$ cf scale myApp -k 512M
```

Use `cf scale APP -m MEMORY` to change the memory limit applied to all instances of your app. `MEMORY` must be an integer followed by either an **M**, for megabytes, or **G**, for gigabytes.

```
$ cf scale myApp -m 1G
```

# Using Cloud Foundry health checks

TAS for VMs provides support for liveness and readiness health checks.

Liveness health checks are performed to validate that app instances are running. When liveness health checks fail, the app instance is marked as crashed and is restarted. Readiness health checks are performed to validate that app instances are ready to serve requests. When readiness health checks fail, the app instance is marked as not ready and removed from the route pool for the app.

You can configure a liveness health check for an app using the Cloud Foundry Command Line Interface (cf CLI) or by specifying a combination of the `health-check-http-endpoint`, `health-check-type`, `health-check-invocation-timeout`, and `health-check-interval` fields in an [app manifest](#).

Readiness health checks are only configurable through the [app manifest](#). To use readiness health checks, you must have:

- garden-runc-release 1.37.0
- diego-release 2.81.0
- capi-release 1.158.0

To configure a health check using the cf CLI, see:

- [Configure health checks when creating or updating](#)
- [Configure health checks for an existing app.](#)

For more information about using an app manifest to configure a health check, see these sections in [Deploying with app manifests](#).

- [health-check-type](#)
- [health-check-interval](#)
- [health-check-http-endpoint](#)
- [health-check-invocation-timeout](#)
- [readiness-health-check-type](#)
- [readiness-health-check-interval](#)
- [readiness-health-check-http-endpoint](#)
- [readiness-health-check-invocation-timeout](#)

App health checks function as part of the app life cycle managed by Diego architecture. For more information, see [Diego components and architecture](#).

## Configure liveness health checks when creating or updating an app

To configure a health check while creating or updating an app, run:

```
cf push APP-NAME --health-check-type LIVENESS-HEALTH-CHECK-TYPE --app-start-timeout LIVENESS-HEALTH-CHECK-TIMEOUT
```

Where:

- `APP-NAME` is the name of your app.
- `LIVENESS-HEALTH-CHECK-TYPE` is the type of liveness health check that you want to configure. Valid health check types are `port`, `process`, and `http`. For more information, see [Health check types](#).
- `LIVENESS-HEALTH-CHECK-TIMEOUT` is the amount of time allowed to elapse between starting an app and the first healthy response. For more information, see [Health check timeouts](#).

For more information about the `cf push` command, enter `cf push --help`.



The health check configuration that you provide with `cf push` overrides any configuration in the app manifest.

## Configure liveness health checks for an existing app

To configure a liveness health check for an existing app or to add a custom HTTP endpoint, run:

```
cf set-health-check APP-NAME LIVENESS-HEALTH-CHECK-TYPE --endpoint CUSTOM-HTTP-ENDPOINT
```

Where:

- `APP-NAME` is the name of your app.
- `LIVENESS-HEALTH-CHECK-TYPE` is the type of the liveness health check that you want to configure. Valid health check types are `port`, `process`, and `http`. For more information, see [Health check types](#).
- `CUSTOM-HTTP-ENDPOINT` is the custom HTTP endpoint that you want to add to the health check. By default, an `http` health check uses `/` as its endpoint unless you specify a custom endpoint. For more information, see [Health check HTTP endpoints](#).

You can also change the health check invocation timeout for an app, use `cf set-health-check`. This option also requires restarting the app. For more information, enter `cf set-health-check --help`.

For more information about the `cf set-health-check` command, enter `cf set-health-check --help`.



After you set the health check configuration of a deployed app with the `cf set-health-check` command, you must restart the app for the change to take effect.

## Understanding health checks

### Health check life cycle

The following table describes how app health checks work.

Stage	Description
1	When deploying the app to TAS for VMs, the developer specifies a liveness and/or a readiness health check, and optionally, a startup timeout with the app manifest.

Stage	Description
2	Cloud Controller creates an LRP for Diego with the specified health check definitions. If no liveness health check is provided, Cloud Controller configures a <code>port</code> liveness health check type. If no readiness health check is provided, Cloud Controller configures a <code>process</code> readiness health check type.
3	When Diego starts an app instance, a separate startup app health check runs every 2 seconds until a response indicates that the app instance is healthy or until the startup timeout elapses. The startup health check uses the same configuration (type, http endpoint, and invocation timeout) as the liveness health check, except for the non-configurable 2-second polling interval.
4	After the startup health check succeeds, the app instance is marked as Running and Diego begins performing the liveness and readiness health checks. Liveness and readiness health checks are run according to their configured health check interval, with a default of 30 seconds.
5	After the readiness health check succeeds, the app instance route is advertised.
6	The app instance is alive, marked as Running, and is routable. The app instance is fully operational.
7	If the readiness health check fails, then the route to the app instance is removed.
8	If the liveness health check fails, Diego considers that particular instance to be unhealthy. Diego stops and deletes the app instance, then reschedules a new app instance. This process of stopping and deleting the app instance is reported back to the Cloud Controller as a crash event.
9	When an app instance fails, Diego immediately attempts to restart the app instance. After three failed restarts, TAS for VMs waits 30 seconds before attempting another restart. The wait time doubles each restart until the ninth restart, and remains at that duration until the 200th restart. After the 200th restart, TAS for VMs stops trying to restart the app instance.

## Health check types

The following table describes the types of health checks available for apps and recommended circumstances in which to use them:

Health check type	Recommended use case	Explanation
<code>http</code>	The app can provide an <code>HTTP 200</code> response.	<p>The <code>http</code> health check performs a GET request to the configured HTTP endpoint on the app's default port. When the health check receives an <code>HTTP 200</code> response, the app is declared healthy. VMware recommends that you use the <code>http</code> health check type whenever possible. A healthy HTTP response ensures that the web app is ready to serve HTTP requests. The configured endpoint must respond within one second to be considered healthy.</p> <div style="background-color: #f0e6ff; padding: 10px; margin-top: 10px;">  <p>To prevent false negatives, use a dedicated endpoint for health checks where response time and result do not depend on business logic.</p> </div>
<code>port</code>	The app can receive TCP connections, including HTTP web apps.	A health check makes a TCP connection to the port or ports configured for the app. For apps with multiple ports, a health check monitors each port. If you do not specify a health check type for your app, then monitoring uses a <code>port</code> health check by default. The TCP connection must be established within one second to be considered healthy.

Health check type	Recommended use case	Explanation
process	The app does not support TCP connections. An example of such an app is a worker.	For a <code>process</code> health check, Diego ensures that any process declared for the app stays running. If the process and all its children exit, Diego stops and deletes the app instance.

## Health check timeouts

The startup timeout value configured for the app process is the amount of time allowed to elapse between starting an app and the first healthy response from the app. If the health check does not receive a healthy response within the configured timeout, then the app is declared unhealthy.

In Tanzu Operations Manager, the default timeout is 60 seconds and the maximum configurable timeout is 600 seconds. You can modify the timeout in the **App Containers** pane of the VMware Tanzu Application Service for VMs (TAS for VMs) tile.

## Health check HTTP endpoints

Only used by `http` type, the `--endpoint` flag of the `cf set-health-check` command specifies the path portion of a URI that must be served by the app and return `HTTP 200` when the app is healthy.

This command only checks the health of the default port of the app.



For HTTP apps, VMware recommends setting the health check type to `http` instead of a simple port check.

## Cloud Foundry API app revisions

A revision represents code and configuration used by an app at a specific time. It is a Cloud Foundry API (CAPI) object that can contain references to a droplet, a custom start command, and environment variables. The most recent revision for a running app represents code and configuration running in Operations Manager. App revisions do not include any tasks run on the app.

For additional information about app revisions, see [Revisions in the Cloud Foundry API \(CAPI\)](#) documentation.



CAPI v3 is the recommended API version for revisions. While revisions work with CAPI v2, there are several inconsistencies. For example, revision descriptions for apps with multiple processes can be inaccurate because CAPI v2 does not support apps with multiple processes. Additionally, pushing an app for the first time with revisions in CAPI v2 creates two revisions.



The app revisions API is experimental, and future releases might have breaking changes.

## Revisions use cases

Some use cases for revisions include:

- **Viewing revisions for an app:** This can help you understand how your app has changed over time.
- **Rolling back to a previous revision:** This allows you to deploy a version of the app that you had running previously without needing to track that previous state yourself or have multiple apps running. When you create a deployment and reference a revision, the revision deploys as the current version of your app.

## Events that trigger revisions

Revisions are generated through these events:

- A new droplet is deployed for an app.
- An app is deployed with new environment variables.
- An app is deployed with a new or changed custom start command.
- An app rolls back to a prior revision.

By default, CAPI retains a maximum of 100 revisions per app.

## Revision descriptions

Each revision includes a description of what changed in your app at the time the revision was created. The description includes one or more of these descriptions:

- `Process type removed`
- `New process type added`
- `Rolled back to revision X`
- `Custom start command removed`
- `Custom start command updated`
- `Custom start command added`
- `New environment variables deployed`
- `New droplet deployed`

## Droplet storage considerations

By default, Operations Manager retains the five most recent staged droplets in its droplets bucket. This means that you can roll back to revisions as long as they are using one of those five droplets. Not all revisions include a change in droplet.

Operators can configure Operations Manager to retain more droplets if necessary using the **Maximum staged droplets per app** field in the **File Storage** pane of the VMware Tanzu Application Service for VMs (TAS for VMs) tile.

## View revisions

This section describes how to use CAPI endpoints for viewing revisions.

## List revision history for an app

To list both current and stopped revisions for an app:

- Using the `revisions` command:

```
cf revisions APP-NAME
```

Where `APP-NAME` is the name of your app.

- Using the `curl` command:

1. Retrieve the GUID of the app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

1. Run:

```
cf curl /v3/apps/GUID/revisions
```

Where `GUID` is the GUID you retrieved in an earlier step.

## Get an app's current revision(s)

The current revision of an app is its currently-deployed, running revision, linked to started processes. There may be multiple currently running revisions during an active canary or rolling deployment. To list an app's current revision(s):

- Using the `revision` command:

```
cf revision APP-NAME
```

Where `APP-NAME` is the name of your app.

- Using the `curl` command

1. Retrieve the GUID of the app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. Run:

```
cf curl /v3/apps/GUID/revisions
```

Where `GUID` is the GUID you retrieved in an earlier step.

## List deployed revisions for an app

Deployed revisions are revisions linked to started processes in an app. To list deployed revisions:

- Using the `revision` command:

```
cf revision APP-NAME
```

Where `APP-NAME` is the name of your app.

- Using the `curl` command

1. Retrieve the GUID of the app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. Run:

```
cf curl /v3/apps/GUID/revisions/deployed
```

Where `GUID` is the GUID you retrieved in an earlier step.

## Retrieve a revision

To retrieve a revision:

- Using the `revision` command:

```
cf revision APP-NAME --version VERSION
```

Where `APP-NAME` is the name of your APP and `VERSION` is the revision version.

- Using the `curl` command:

1. Run:

```
cf curl /v3/revisions/GUID
```

Where `GUID` is the GUID of the revision.

## Roll back to a previous revision

To roll back to a previous revision:

- Using the `rollback` command:

```
cf rollback APP-NAME --version VERSION
```

Where `APP-NAME` is the name of your APP and `VERSION` is the revision version you want to rollback to.

- Using `curl` command:

1. Retrieve the GUID of the app:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. Retrieve the GUID of the revision. See [Retrieve a revision](#).
3. Create a deployment using CAPI by running:

```
cf curl v3/deployments \
-X POST \
-d '{
  "revision": {
    "guid": "REVISION-GUID"
  },
  "relationships": {
    "app": {
      "data": {
        "guid": "APP-GUID"
      }
    }
  }
}'
```

Where:

- `REVISION-GUID` is the GUID of the revision.
- `APP-GUID` is the GUID of the app.

## Add metadata to a revision

To add metadata to a revision, see [Add metadata to an object](#).

## Deactivate revisions for an app

CAPI activates app revisions by default. To deactivate revisions for an app, you must manually turn them off.

To deactivate revisions for an app:

1. Retrieve the GUID of the app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of your app.

2. Run:

```
cf curl /v3/apps/GUID/features/revisions -X PATCH -d '{ "enabled": false }'
```

Where `GUID` is the GUID you retrieved in an earlier step.

## Configuring container-to-container networking

The container-to-container networking feature allows direct network traffic between apps. For an overview of how container-to-container networking works, see [Container-to-container networking](#).



Container-to-container networking is not available for apps hosted on Microsoft Windows.

Container-to-container networking enables VMware Tanzu Application Service for VMs (TAS for VMs) to generate logs whenever containers communicate or attempt to communicate with each other. For more information about managing app traffic logging, see the [App Traffic Logging](#) section of the *Configuring Logging in TAS for VMs* topic.

## Configure the Overlay Network

Container-to-container networking uses an overlay network to manage communication between app instances. By default, each Diego Cell in the overlay network is allocated a /24 range that supports 254 containers per Diego Cell, one container for each of the usable IP addresses, .1 through .254. For more information about the overlay network, see [Overlay network](#) in *Container-to-Container Networking*.

### Configure the Number of Diego Cells

To modify the number of Diego Cells supported by the overlay network:

1. In Tanzu Operations Manager, click the TAS for VMs tile.
2. Click **Networking**.
3. Under **Overlay subnet**, enter an IP range for the overlay network. By default, Tanzu Operations Manager uses [10.255.0.0/16](#). Modifying the subnet range allocated to the overlay network changes the number of Diego Cells supported in your deployment. For guidance, see the following table:

Overlay subnet mask	Number of Diego Cells	Containers per Diego Cell
/20	15	254
/16	255	254
/12	4,095	254

The overlay network IP address range must not conflict with any other IP addresses in the network. If a conflict exists, Diego Cells cannot reach any endpoint that has a conflicting IP address.

## Create and manage networking policies

This section describes how to create and edit container-to-container networking policies using the Cloud Foundry Command Line Interface (cf CLI).



You can also create and modify container-to-container networking policies using Apps Manager. For more information, see [Create Container-to-Container Networking Policies](#) in the *Managing Apps and Service Instances Using Apps Manager* topic.

## Prerequisites

Ensure that you are using cf CLI v7 or later:

```
$ cf version
```

For more information about updating the cf CLI, see [Installing the cf CLI](#).

## Grant permissions

Cloud Foundry admins use the following UAA scopes to grant specific users or groups permissions to configure network policies:

UAA Scope	Suitable for...	Allows users to create policies...
<code>network.admin</code>	operators	for any apps in the Cloud Foundry deployment
<code>network.write</code>	space developers	for apps in spaces that they can access

If you are a Cloud Foundry admin, you already have the `network.admin` scope. An admin can also grant the `network.admin` scope to a space developer.

For more information, see [Creating and Managing Users with the UAA CLI \(UAAC\)](#) and [Orgs, spaces, roles, and permissions](#).

To grant all Space Developers permissions to configure network policies, open the **App Developer Controls** pane in the TAS for VMs tile and enable the **Allow space developers to manage network policies** check box.

By default, Space Developers can add a maximum of 150 network policies per source app. Operators can increase this limit by changing the **Maximum number of network policies per app source** property in the **App Developer Controls** tab. This limit does not apply to users with the `network.admin` scope.

## Add a network policy

To add a policy that allows direct network traffic from one app to another, run:

```
cf add-network-policy SOURCE-APP DESTINATION-APP -s DESTINATION-SPACE-NAME -o DESTINATION-ORG-NAME --protocol (tcp | udp) --port RANGE
```

Where:

- `SOURCE-APP` is the name of the app that sends traffic.
- `DESTINATION-APP` is the name of the app that receives traffic.
- `DESTINATION-SPACE-NAME` is the space of the destination app. The default is the targeted space.
- `DESTINATION-ORG-NAME` is the org of the destination app. The default is the targeted org.
- `PROTOCOL` is either: `tcp` or `udp`.
- `RANGE` contains the ports at which to connect to the destination app. The allowed range is from `1` to `65535`. You can specify a single port, such as `8080`, or a range of ports, such as `8080-8090`. Port `61443` is used for TLS communication.

Use the `add-network-policy` command to allows access from the `frontend` app to the `backend` app over TCP at port `8080`. Here is an example:

```
$ cf add-network-policy frontend backend --protocol tcp --port 8080
Adding network policy to app frontend in org my-org / space dev as admin...
OK
```

Space Developers can add up to 150 network policies per space. This limit does not apply to users with the `network.admin` scope.

## List policies

You can list all the policies in your space, or just the policies for which a single app is the source:

- To list all the policies in your space, run `cf network-policies`.

```
$ cf network-policies
```

- To list the policies for an app, run `cf network-policies --source MY-APP`. Replace `MY-APP` with the name of your app.

```
$ cf network-policies --source example-app
```

The following example of the `network-policy` command lists policies for the app `frontend`:

```
$ cf network-policies --source frontend
Listing network policies in org my-org / space dev as admin...

source      destination    protocol   ports      destination space    dest
destination org
frontend     backend        tcp         8080      example-space    exam
ple-org
```

## Remove a network policy

To remove a policy that allows direct network traffic from an app, run:

```
cf remove-network-policy SOURCE-APP DESTINATION-APP -s DESTINATION-SPACE-NAME -o DESTINATION-ORG-NAME --protocol PROTOCOL --port RANGE
```

Where:

- `SOURCE-APP` is the name of the app that sends traffic.
- `DESTINATION-APP` is the name of the app that receives traffic.
- `DESTINATION-SPACE-NAME` is the space of the destination app. The default is the targeted space.
- `DESTINATION-ORG-NAME` is the org of the destination app. The default is the targeted org.
- `PROTOCOL` is either `tcp` or `udp`.
- `PORTS` are the ports connecting the apps. The allowed range is from `1` to `65535`. You can specify a single port, such as `8080`, or a range of ports, such as `8080-8090`.

The `remove-network-policy` command deletes the policy that allows the `frontend` app to communicate with the `backend` app over TCP on port 8080. Here is an example:

```
$ cf remove-network-policy frontend backend --protocol tcp --port 8080
Removing network policy to app frontend in org my-org / space dev as admin...
OK
```

## Deactivate network policy enforcement

You can deactivate Silk network policy enforcement between apps. Deactivating network policy enforcement allows all apps to send network traffic to all other apps in the foundation despite no policy specifically allowing it.

To deactivate network policy enforcement between apps:

1. Go to Tanzu Operations Manager Installation Dashboard.
2. Click the **VMware Tanzu Application Service for VMs** tile.
3. Select **Networking**.
4. Deselect the **Enforce Silk network policy** check box.
5. Click **Save**.

## App service discovery

With app service discovery, apps pushed to TAS for VMs can establish container-to-container communications through a known route served by internal BOSH DNS. This allows front end apps to easily connect with back end apps.



The internal domain used for service discovery is `apps.internal` by default. Operators can modify this value in **App Developer Controls** pane of the TAS for VMs tile.

To establish container-to-container communications between a front end and back end app, a developer:

1. Runs a back end app that publishes a local endpoint.
2. Maps a named route to the endpoint.
3. Creates a network policy that allows direct traffic from the front end to the back end app.
4. Run the front end app.

See [Cats and Dogs with Service Discovery](#) in GitHub for an example, written in Go, that demonstrates communication between front end and back end apps.

To use TLS developer adds a network policy for port 61443. After that the front end app can reach the back end app using HTTPS, `https://backend-app.apps.internal:61443`, for example.

## Managing services

In this section:

- **Service brokers**
  - [Service broker examples](#)
  - [Binding credentials](#)
  - [Enabling service instance sharing](#)
  - [App log streaming](#)
  - [Route services](#)

- Supporting multiple TAS for VMs instances
- Managing service instances with the cf CLI
- Sharing service instances
- Delivering service credentials to an app
- Managing service keys
- Managing app requests with route services
- Configuring Play Framework service connections
- Using an external file system (volume services)
- User-provided service instances

## Service Brokers

In this section:

- Service broker examples
- Binding credentials
- Enabling service instance sharing
- App log streaming
- Offering route services

## Service Broker examples

The following example service broker applications have been developed in Cloud Foundry. This is a good starting point if you are developing your own service broker.

### Ruby

- [GitHub Repository service](#) - this is designed to be an easy-to-read example of a service broker, with complete documentation, and comes with a demo app that uses the service. The broker can be deployed as an application to any Cloud Foundry instance or hosted elsewhere. The service broker uses GitHub as the service back end.
- [MySQL database service](#) - this broker and its accompanying MySQL server are designed to be deployed together as a [BOSH](#) release. BOSH is used to deploy or upgrade the release, monitors the health of running components, and restarts or recreates unhealthy VMs. The broker code alone can be found [here](#).

### Java

- [Spring Cloud - Cloud Foundry Service Broker](#) - This implements the REST contract for service brokers and the artifacts are published to the Spring Maven repository. This greatly simplifies development: include a single dependency in Gradle, implement interfaces, and configure. A sample implementation has been provided for [MongoDB](#).

- MySQL Java Broker - a Java port of the Ruby-based MySQL broker.

## Go

- Asynchronous Service Broker for AWS EC2 - This broker implements support for [Asynchronous Service Operations](#), and calls AWS APIs to provision EC2 VMs.

## Binding credentials

A bindable service returns credentials that an application can consume in response to the `cf bind` API call. Cloud Foundry writes these credentials to the `VCAP_SERVICES` environment variable. In some cases, buildpacks can write a subset of these credentials to other environment variables that frameworks might need.

Choose from the following list of credential fields, if possible, although you can provide additional fields as needed. Refer to the [Using Bound Services](#) section of the *Managing Service Instances with the CLI* topic for information about how these credentials are consumed.

If you provide a service that supports a connection string, provide the `uri` key for buildpacks and application libraries to use.

Credentials	Description
uri	Connection string of the form <code>DB-TYPE://USERNAME:PASSWORD@HOSTNAME:PORT/NAME</code> , where <code>DB-TYPE</code> is a type of database such as mysql, postgres, mongodb, or amqp.
hostname	FQDN of the server host
port	Port of the server host
name	Name of the service instance
vhost	Name of the messaging server virtual host - a replacement for a <code>name</code> specific to AMQP providers
username	Server user
password	Server password

The following is an example output of `ENV['VCAP_SERVICES']`.

Depending on the types of databases you are using, each database might return different credentials.

```
VCAP_SERVICES=
{
  cleardb: [
    {
      name: "cleardb-1",
      label: "cleardb",
      plan: "spark",
      credentials: {
        name: "ad_c6f4446532610ab",
        hostname: "us-cdbr-east-03.cleardb.com",
        port: "3306",
        username: "b5d435f40dd2b2",
        password: "ebfc00ac",
        uri: "mysql://b5d435f40dd2b2:ebfc00ac@us-cdbr-east-03.cleardb.com:3306/ad_c6f4446532610ab",
      }
    }
  ]
}
```

```

    jdbcUrl: "jdbc:mysql://b5d435f40dd2b2:ebfc00ac@us-cdbr-east-03.cleardb.com:330
6/ad_c6f4446532610ab"
    }
}
],
cloudamqp: [
{
  name: "cloudamqp-6",
  label: "cloudamqp",
  plan: "lemur",
  credentials: {
    uri: "amqp://ksvyjmiv:IwN6dCdZmeQD400ZPKpu1YOaLx1he8wo@lemur.cloudamqp.com/ksv
yjmv"
  }
}
{
  name: "cloudamqp-9dbc6",
  label: "cloudamqp",
  plan: "lemur",
  credentials: {
    uri: "amqp://vhuklnxa:9lNFxpTuJsAdTts98vQIdKHW3MojyMyV@lemur.cloudamqp.com/vhu
klnxa"
  }
},
rediscloud: [
{
  name: "rediscloud-1",
  label: "rediscloud",
  plan: "20mb",
  credentials: {
    port: "6379",
    host: "pub-redis-6379.us-east-1-2.3.ec2.redislabs.com",
    password: "1M5zd3QfWi9nUyya"
  }
},
]
}

```

## Service Instance sharing

You can allow instances of your services to be shared across spaces and orgs within Cloud Foundry. This allows apps running in different spaces and orgs to use the same service instance.

If you have Space Developer permissions in the space where the service instance was created, you are responsible for sharing, unsharing, updating, and deleting the service instance.

For more information about the developer and administrator tasks related to service instance sharing, see [Sharing Service Instances](#).

## Enabling service instance sharing

Service brokers must explicitly activate service instance sharing by setting a flag in their service-level metadata object. This allows service instances, of any service plan, to be shared across orgs and spaces. The `"shareable"` flag must be set to `true` in the service-level metadata to activate service instance sharing. If the flag is set to `false` or is absent, sharing is deactivated.

An example catalog:

```
{
  "services": [
    {
      "id": "766fa866-a950-4b12-adff-c11fa4cf8fdc",
      "name": "example-service",
      "metadata": {
        "shareable": true
      }
    }
  ]
}
```

## Binding permissions based on instance sharing

When a service instance is created in one space and shared into another, you can bind your apps to the service instance from both spaces.

You might want to have the service broker return credentials with different permissions depending on which space an app is bound from. For example, a messaging service can permit writes from the originating space and only reads from any spaces that the service is shared into.

To determine whether the space of the app is the same as the originating space of the service instance, the service broker can compare the `context.space_guid` and `bind_resource.space_guid` fields in the binding request. The `context.space_guid` field represents the space where the service instance was created, and `bind_resource.space_guid` represents the space of the app involved in the binding.

## Security considerations

You must consider the following before enabling service instance sharing:

- [Service keys](#) can only be generated if you have access to the space where the service instance was created. This verifies that only developers with access to this space have visibility into where and how many times the service instance is used. It is not possible to distinguish between service keys created when targeting the originating space and those created when targeting the space where the instance has been shared to. Also, unsharing an instance from a space does not delete any service keys.
- Consider the impact of giving out excessive permissions for service bindings, especially bindings that originate from spaces that the service instance has been shared into. For example, a messaging service can permit writes from the originating space and only reads from any shared spaces. For more information, see [Binding Permissions Based on Instance Sharing](#).
- You can generate unique credentials for each binding. This makes sure that developers can unshare a service instance at any time. Unsharing an instance deletes any service bindings and revokes access for those credentials. Unsharing an instance prevents unauthorized future access from developers and apps that saved the credentials that they were previously provided using the service binding.
- Consider the impact of a service instance dashboard being accessed by users of shared service instances. If authenticating through SSO, see [Dashboard Single Sign-On](#).

## App Log streaming

When you bind an application to an instance of an applicable service, Cloud Foundry streams logs for the bound application to the service instance.

- Logs for all apps bound to a log consuming service instance are streamed to that instance.
- Logs for an app bound to multiple log consuming service instances are streamed to all instances.

To activate this capability, a service broker must implement the following:

1. In the `catalog` endpoint, the broker must include `requires: syslog_drain`. This minor security measure validates that a service returning a `syslog_drain_url` in response to the `bind` operation has also declared that it expects log streaming. If the broker does not include `requires: syslog_drain`, and the bind request returns a value for `syslog_drain_url`, Cloud Foundry returns an error for the bind operation.
2. In response to a `bind` request, the broker returns a value for `syslog_drain_url`. The syslog URL has a scheme of syslog, syslog-tls, or https and can include a port number. For example:  
`"syslog_drain_url": "syslog://logs.example.com:1234"`

## How does it work?

1. Service broker returns a value for `syslog_drain_url` in response to bind.
2. Loggregator periodically polls an internal Cloud Controller endpoint for updates.
3. Upon discovering a new `syslog_drain_url`, Loggregator identifies the associated app.
4. Loggregator streams app logs for that app to the locations specified by the service instances' `syslog_drain_urls`.

You can manually configure app logs to be streamed to a location of your choice using user-provided service instances.

For details, see [Using Third-Party Log Management Services](#).

## Offering route services

You can offer a service to a VMware Tanzu Application Service for VMs (TAS for VMs) services Marketplace.

For information about consuming these services, see [Managing App Requests with Route Services](#).

TAS for VMs app developers might want to apply transformation or processing to requests before they reach an app. Common use cases include authentication, rate limiting, and caching services.

Route services are a kind of Marketplace service that you can use to apply various transformations to app requests by binding an app's route to a service instance. Through integrations with service brokers and, optionally, with the TAS for VMs routing tier, providers can offer these services with a familiar, automated, self-service, and on-demand user experience.

The procedures in this topic use the Cloud Foundry Command Line Interface (cf CLI). You can also manage route services using Apps Manager. For more information, see the [Manage Route Services](#) section of the [Managing Apps and Service Instances Using Apps Manager](#) topic.

## Architecture

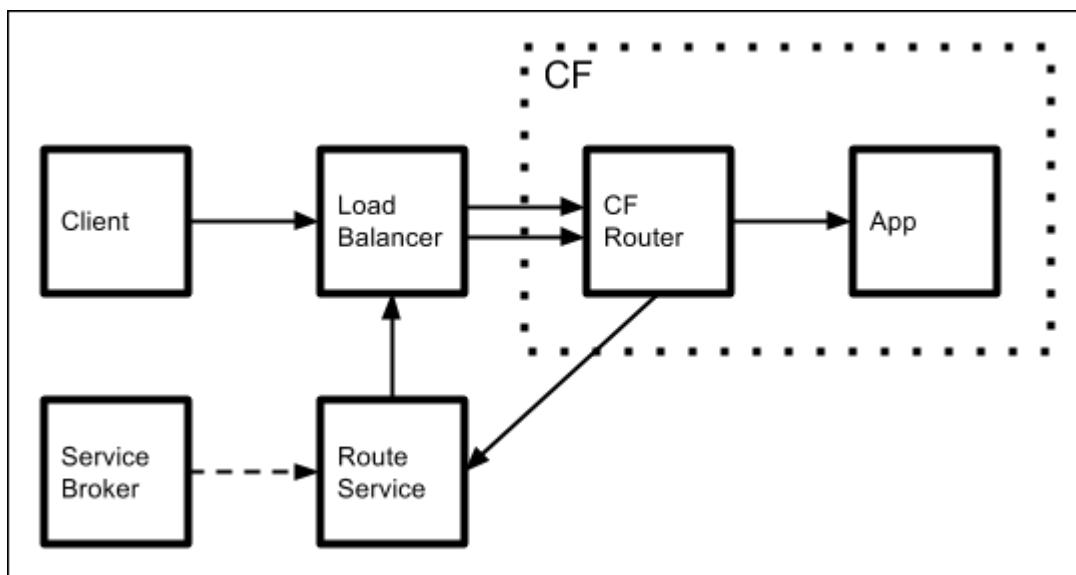
TAS for VMs supports the following models for route services, each of which is described in this topic:

- Fully-brokered services
- Static, brokered services
- User-provided services

In each model, you configure a route service to process traffic addressed to an app.

## Fully-brokered service

In the fully-brokered service model, the TAS for VMs router receives all traffic to apps in the deployment before any processing by the route service. You can bind a route service to any app, and if an app is bound to a route service, the TAS for VMs router sends the traffic to the service. After the route service processes requests, it sends it back to the load balancer in front of the TAS for VMs router. The second time through, the TAS for VMs router recognizes that the route service has already handled them, and forwards them directly to app instances.



The route service can run inside or outside of TAS for VMs, as long as it fulfills the [Service Instance responsibilities](#) to integrate it with the TAS for VMs router.

A service broker publishes the route service to the TAS for VMs marketplace, and makes it available to developers.

You can then create an instance of the service and bind it to your apps with the following commands:

```

cf create-service BROKER-SERVICE-PLAN SERVICE-INSTANCE
cf bind-route-service YOUR-APP-DOMAIN SERVICE-INSTANCE [--hostname HOSTNAME] [--path PATH]
  
```

You can configure the service either through the service provider web interface or by passing [arbitrary parameters](#) to their `cf create-service` call through the `-c` flag.

### Advantages:

- Developers can use a Service Broker to dynamically configure how the route service processes traffic to specific apps.

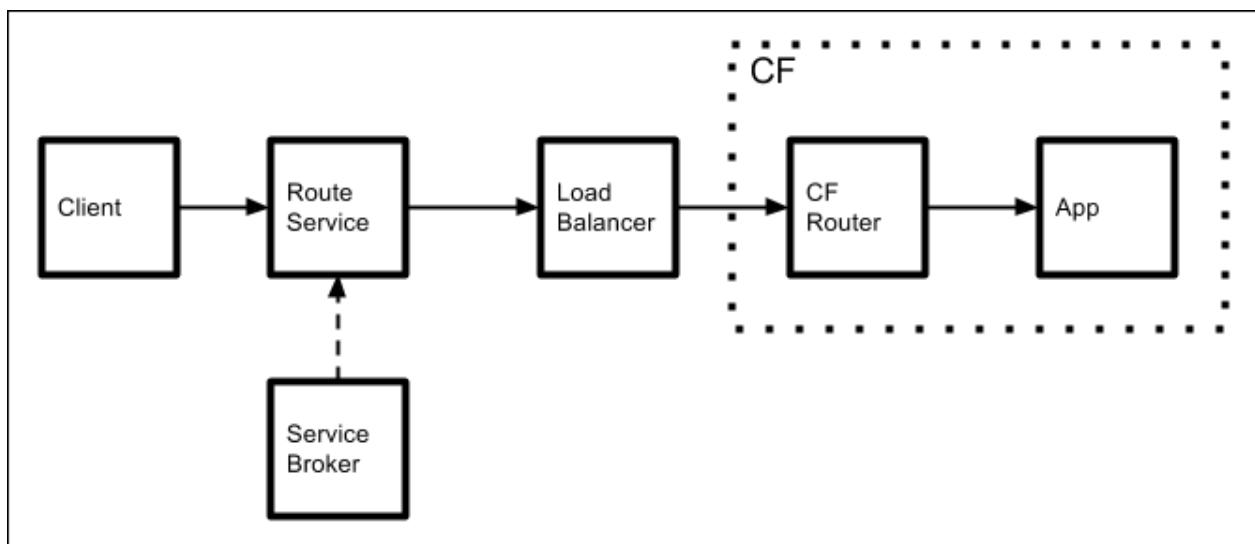
- Adding route services requires no manual infrastructure configuration.
- Traffic to apps that do not use the service makes fewer network hops because requests for those apps do not pass through the route service.

#### Disadvantages:

- Traffic to apps that use the route service makes additional network hops, as compared to the static model.

## Static, brokered service

In the static brokered service model, an operator installs a static routing service, which might be a piece of hardware, in front of the load balancer. The routing service runs outside of TAS for VMs and receives traffic to all apps running in the TAS for VMs deployment. The service provider creates a service broker to publish the service to the TAS for VMs marketplace. As with a fully-brokered service, you can use the service by instantiating it with `cf create-service` and binding it to an app with `cf bind-route-service`.



In this model, you configure route services on an app-by-app basis. When you bind a service to an app, the service broker directs the routing service to process that app's traffic rather than passing the requests through unchanged.

#### Advantages:

- Developers can use a service broker to dynamically configure how the route service processes traffic to specific apps.
- Traffic to apps that use the route service takes fewer network hops.

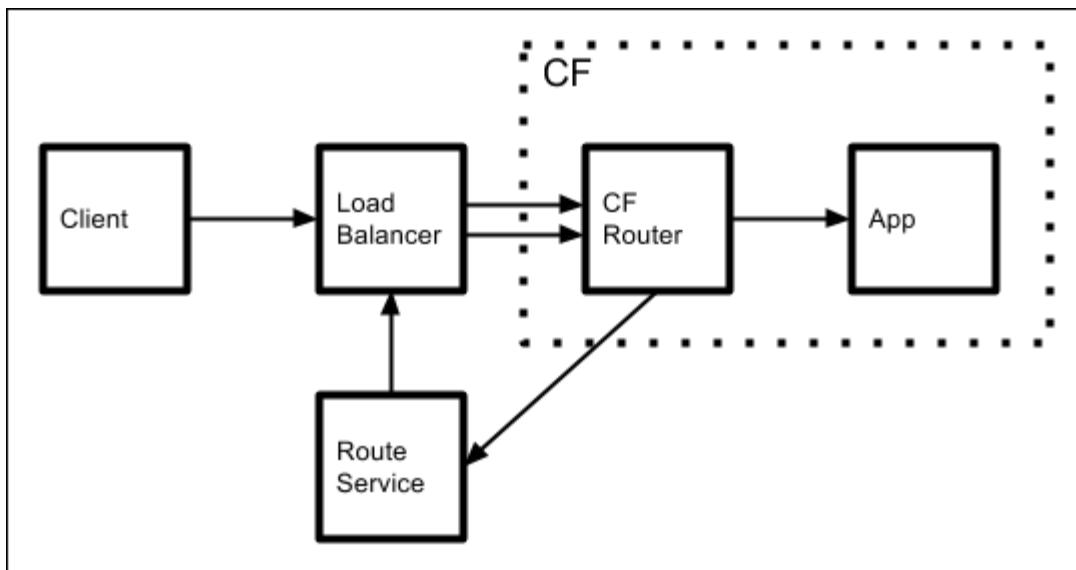
#### Disadvantages:

- Adding route services requires manual infrastructure configuration.
- Traffic to apps that do not use the route service make unnecessary network hops. Requests for all apps hosted by the deployment pass through the route service component.

## User-provided service

If a route service is not listed in the TAS for VMs marketplace by a broker, you can still bind it to your app as a user provided service. The service can run anywhere, either inside or outside of TAS for VMs, but it

must fulfill the integration requirements described in [Service Instance responsibilities](#). The service also needs to be reachable by an outbound connection from the TAS for VMs router.



This model is identical to the fully-brokered service model, except without the broker. You can configure the service manually, outside of TAS for VMs.

You can then create a user provided service instance and bind it to your app with the following commands, that supply the URL of their route service:

```

cf create-user-provided-service SERVICE-INSTANCE -r ROUTE-SERVICE-URL
cf bind-route-service DOMAIN SERVICE-INSTANCE [--hostname HOSTNAME]
  
```

#### **Advantages:**

- Adding route services requires no manual infrastructure configuration.
- Traffic to apps that do not use the service makes fewer network hops because requests for those apps do not pass through the route service.

#### **Disadvantages:**

- You must manually provision and configure route services out of the context of TAS for VMs because no service broker automates these operations.
- Traffic to apps that use the route service makes additional network hops, as compared to the static model.

## Architecture comparison

The previous models require the broker and service instance responsibilities summarized in the following table:

Route Services Architecture	Fulfils TAS for VMs Service Instance Responsibilities (1)	Fulfils TAS for VMs Broker Responsibilities (2)
Fully-Brokered	Yes	Yes
Static Brokered	No	Yes

Route Services Architecture	Fulfils TAS for VMs Service Instance Responsibilities (1)	Fulfils TAS for VMs Broker Responsibilities (2)
User-Provided	Yes	No

1 - See [Service Instance Responsibilities](#)

2 - See [Broker Responsibilities](#)

## Service instance

The following information applies only when a broker returns `route_service_url` in a bind response.

Binding a service instance to a route associates the `route_service_url` with the route in the TAS for VMs router. All requests for the route are proxied to the URL specified by `route_service_url`.

The TAS for VMs router includes the `X-CF-Forwarded-Url` header containing the originally requested URL, as well as the `X-CF-Proxy-Signature` and `X-CF-Proxy-Metadata` headers used by the router to validate that the route-service sent the request. These headers are described in the [Headers](#) section.

## Service instance responsibilities

The route service must handle requests by either:

- Accepting the request, making a new request to the original requested URL, or to another location, and then responding to the original requestor
- Rejecting the request by responding with a non-`2xx` HTTP status code

When forwarding a request to the originally requested URL, the route service must forward the `X-CF-Forwarded-Url`, `X-CF-Proxy-Signature`, and `X-CF-Proxy-Metadata` headers on the request. If it doesn't, it is rejected. When forwarding a request to a location other than the originally requested URL, the route service strips these headers.

## Headers

The following HTTP headers are added by the Gorouter to requests forwarded to route services.

### X-CF-Forwarded-Url

The `X-CF-Forwarded-Url` header contains the originally requested URL. The route service might choose to forward the request to this URL or to another.

### X-CF-Proxy-Signature

When the Gorouter receives a request with this header, it accepts and forwards the request to the app only if the URL of the request matches the one associated with the token, and the request was received on time. Otherwise, the request is rejected.

`X-CF-Proxy-Signature` also signals to the Gorouter that a request has transited a route service. If this header is present, the Gorouter does not forward the request to a route service. The route service needs to forward these headers in subsequent requests to the original requested URL, so that it knows not to send the request back to the route service but to the app. The headers must NOT be sent in the HTTP response to the GoRouter, only in the new HTTP request to the GoRouter.

CF-hosted Route Services cannot be chained: If the route service forwards the request to a URL to resolve a route for a different app on TAS for VMs, the route must not have a bound route service. Otherwise, the request is rejected as the requested URL does not match the one in the forwarded `X-CF-Proxy-Signature` header.



The `X-CF-Proxy-Signature` header is an **access token**. Anyone possessing your `X-CF-Proxy-Signature` token can bypass the route service. Do not share your `X-CF-Proxy-Signature` token with anyone.

## X-CF-Proxy-Metadata

The `X-CF-Proxy-Metadata` header aids in the encryption and description of `X-CF-Proxy-Signature`.

## SSL certificates

When TAS for VMs is deployed in a development environment, certificates hosted by the load balancer are self-signed, and not signed by a trusted Certificate Authority. When the route service finishes processing an inbound request and makes a call to the value of `X-CF-Forwarded-Url`, be prepared to accept the self-signed certificate when integrating with a non-production deployment of TAS for VMs.

## Timeouts

Route services must forward the request to the app route within 60 seconds.

In addition, all requests must respond in 900 seconds.

## Broker responsibilities

### Catalog endpoint

Brokers must include `requires: ["route_forwarding"]` for a service in the catalog endpoint. If this is not present, TAS for VMs does not permit users to bind an instance of the service to a route.

### Binding endpoint

When you bind a route to a service instance, TAS for VMs sends a bind request to the broker, including the route address, with `bind_resource.route`. A route is an address used by clients to reach apps mapped to the route. The broker might return `route_service_url`, containing a URL where TAS for VMs proxies requests for the route. This URL must have an `https` scheme, or the Cloud Controller rejects the binding. `route_service_url` is optional, and not returning this field allows a broker to dynamically configure a network component already in the request path for the route, requiring no change in the TAS for VMs router.

For more information about bind requests, see the [Binding](#) section of the *Open Service Broker API (v2.13)* specification on GitHub.

## Route services examples

- **Logging Route Service:** This route service can be pushed as an app to TAS for VMs. It fulfills the service instance responsibilities and logs requests received and sent. It can be used to see the route service integration in action by tailing its logs.
- **Rate Limiting Route Service:** This example route service is a simple TAS for VMs app that provides rate limiting to control the rate of traffic to an app.
- **Spring Boot examples.**

## Tutorial

The following instructions show how to use the Logging Route Service described in [Route Services examples](#) to verify that when a route service is bound to a route, requests for that route are proxied to the route service.

For a video of this tutorial, see [Route Services in Pivotal Cloud Foundry 1.7](#) on YouTube.

These commands require the Cloud Foundry Command Line Interface (cf CLI) v6.16 or later.

To use the logging route service:

1. Push the logging route service as an app by running:

```
cf push logger
```

2. Create a user provided service instance, and include the route of the logging route service you pushed as `route_service_url`. Make sure to use `https` for the scheme.

Run:

```
cf create-user-provided-service mylogger -r https://logger.cf.example.com
```

3. Push a sample app such as [Spring Music](#). By default, this creates a route `spring-music.cf.example.com`.

Run:

```
cf push spring-music
```

4. Bind the user provided service instance to the route of your sample app. The `bind-route-service` command takes a route and a service instance.

The route is specified in the following example by domain `cf.example.com` and hostname `spring-music`.

Run:

```
cf bind-route-service cf.example.com mylogger --hostname spring-music
```

5. Tail the logs for your route service by running:

```
cf logs logger
```

6. Send a request to the sample app and view in the route service logs that the request is forwarded to it by running:

```
curl spring-music.cf.example.com
```

## Supporting Multiple TAS for VMs Instances

You can register your service broker with multiple VMware Tanzu Application Service for VMs (TAS for VMs) instances.

It might be necessary for the broker to know which TAS for VMs instance is making a given request. For example, when using [Dashboard Single Sign-On](#), the broker is expected to interact with the authorization and token endpoints for a given TAS for VMs instance.

There are two strategies that can be used to discover which TAS for VMs instance is making a given request.

### Routing and authentication

The broker can use unique credentials, a unique URL, or both for each TAS for VMs instance. When registering the broker, you can configure different TAS for VMs instances to use different base URLs that include a unique ID. For example:

- On TAS for VMs instance 1, the service broker is registered with the URL `broker.example.com/123`.
- On TAS for VMs instance 2, the service broker is registered with the URL `broker.example.com/456`.

### X-Api-Info-Location header

All calls to the broker from TAS for VMs include an `X-Api-Info-Location` header containing the `/v2/info` URL for that instance. The `/v2/info` endpoint returns further information, including the location of that TAS for VMs instance's UAA.

Support for this header was introduced in cf-release v212.

## Managing service instances with the cf CLI

You can manage life cycle operations for service instances using the Cloud Foundry CLI (cf CLI). This includes creating, updating, and deleting service instances. For information about other service management operations, see [Services overview](#). If you are interested in building services for Tanzu Operations Manager and making them available to end users, see [Services](#).

To run the commands in this topic, you must first install the Cloud Foundry Command Line Interface (cf CLI). See the [Cloud Foundry Command Line Interface](#) topics for more information.

### List Marketplace services

After targeting and logging into Cloud Foundry, to view the services available to your targeted organization, run the cf CLI command:

```
cf marketplace
```

Available services can differ between organizations and between Cloud Foundry Marketplaces.

```
$ cf marketplace
Getting services from marketplace in org my-org / space test as user@example.com...
OK

service          plans           description          brok
er
p-mysql          100mb, 1gb      A DBaaS            mysq
l-broker
p-riakcs         developer       An S3-compatible object store   obje
ct-store-broker
```

## Creating service instances

You can create a service instance by running:

```
cf create-service SERVICE PLAN SERVICE-INSTANCE-NAME
```

Where:

- **SERVICE**: The name of the service you want to create an instance of.
- **PLAN**: The name of a plan that meets your needs. Service providers use **plans** to offer varying levels of resources or features for the same service.
- **SERVICE-INSTANCE-NAME**: The name you provide for your service instance. You use this name to refer to your service instance with other commands. Service instance names can include alphanumeric characters, hyphens, and underscores, and you can rename the service instance at any time.

For example:

```
$ cf create-service rabbitmq small-plan my-rabbitmq

Creating service my-rabbitmq in org console / space development as user@example.com...
OK
```

User-provided service instances provide a way for developers to bind apps with services that are not available in their Cloud Foundry Marketplace. For more information, see [User-provided service instances](#).

When multiple brokers provide two or more services with the same name, you must specify the broker by including the `-b BROKER` flag in the `cf create-service` command.

## Arbitrary parameters

Arbitrary parameters require cf CLI v6.12.1+ or higher.

Some services support providing additional configuration parameters with the provision request. Pass these parameters in a valid JSON object containing service-specific configuration parameters, provided either in-

line or in a file. For a list of supported configuration parameters, see the documentation for the particular service offering.

Example providing service-specific configuration parameters in-line:

```
$ cf create-service my-db-service small-plan my-db -c '{"storage_gb":4}'  
  
Creating service my-db in org console / space development as user@example.co  
m...  
OK
```

Example providing service-specific configuration parameters in a file:

```
$ cf create-service my-db-service small-plan my-db -c /tmp/config.json  
  
Creating service my-db in org console / space development as user@example.co  
m...  
OK
```

## Instance tags

*Instance tags require cf CLI v6.12.1+*

Some services provide a list of tags that Cloud Foundry delivers in the [VCAP\\_SERVICES environment variable](#). These tags provide developers with a more generic way for apps to parse [VCAP\\_SERVICES](#) for credentials. Developers might provide their own tags when creating a service instance by including the `-t` flag followed by a comma-separated list of tags.

Example providing a comma-separated list of tags:

```
$ cf create-service my-db-service small-plan my-db -t "prod, workers"  
  
Creating service my-db in org console / space development as user@example.co  
m...  
OK
```

## List service instances

To list the service instances in your targeted space, run:

```
cf services
```

The output from running this command includes any bound apps and the state of the last requested operation for the service instance.

```
$ cf services  
Getting services in org my-org / space test as user@example.com...  
OK  
  
name      service      plan      bound apps      last operation      broker  
upgrade  available
```

mybucket	p-riakcs	developer	myapp	create succeeded	object-
store-broker	no				
mydb	p-mysql	100mb		create succeeded	mysql-b
roker	yes				

## Get details for a particular service instance

Details include dashboard urls, if applicable, and operation start and last updated timestamps.

```
$ cf service mydb

service instance:      mydb
service:              p-mysql
plan:                100mb
description:          mysql databases on demand
documentation url:
dashboard:            https://p-mysql.example.com/manage/instances/abcd-ef1
2-3456
service broker:       mysql-broker

This service is not shared.

Showing status of last operation from service mydb...

status:    create succeeded
message:
started:   2019-02-13T12:02:19Z
updated:   2019-02-13T12:02:19Z

There are no bound apps for this service.
```

## Bind a service instance

Depending on the service, you can bind service instances to apps and routes.

Not all services support binding, as some services deliver value to users directly without integration with Cloud Foundry, such as SaaS apps.

### Bind a service instance to an app

Depending on the service, binding a service instance to your app might deliver credentials for the service instance to the app. See [Delivering service credentials to an app](#) for more information. Binding a service instance to an app can trigger app logs to be streamed to the service instance. See [Streaming app logs to log management services](#).

You must restart, or in some cases, re-push your app for changes to be applied to the `VCAP_SERVICES` environment variable and for the app to recognize these changes.

```
$ cf bind-service my-app mydb
Binding service mydb to my-app in org my-org / space test as user@example.co
m...
```

```
OK
```

TIP: Use 'cf push' to ensure your env variable changes take effect

```
$ cf restart my-app
```

## Binding with app manifest

As an alternative to binding a service instance to an app after pushing an app, you can use the app manifest to bind the service instance during push. As of cf CLI v6.12.1, [Arbitrary parameters](#) are not supported in app manifests. Using the manifest to bind service instances to routes is also not supported.

This excerpt from an app manifest binds a service instance called `test-mysql-01` to the app on push.

```
services:
  - test-mysql-01
```

This excerpt from the `cf push` command and response demonstrates that the cf CLI reads the manifest and binds the service instance to an app called `test-msg-app`.

```
$ cf push
Using manifest file /Users/Bob/test-apps/test-msg-app/manifest.yml

...
Binding service test-mysql-01 to test-msg-app in org My-Org / space development as user@example.com
OK
```

For more information about app manifests, see [Deploying with app manifests](#).

## Bind a service instance to a route

Binding a service instance to a route causes app requests and responses to be proxied through the service instance, where it can be used to transform or intermediate requests. For more information, see [Managing app requests with route services](#).

```
$ cf bind-route-service shared-domain.example.com --hostname my-app my-service-instance
Binding route my-app.shared-domain.example.com to service instance my-service-instance in org my-org / space test as user@example.com...
OK
```

Restaging your app is not required.

## Arbitrary parameters

*Arbitrary parameters require cf CLI v6.12.1+*

Some services support additional configuration parameters with the bind request. These parameters are passed in a valid JSON object containing service-specific configuration parameters, provided either in-line

or in a file. For a list of supported configuration parameters, see documentation for the particular service offering.

```
$ cf bind-service rails-sample my-db -c '{"role":"read-only"}'

Binding service my-db to app rails-sample in org console / space development
as user@example.com...
OK
```

```
$ cf bind-service rails-sample my-db -c /tmp/config.json

Binding service my-db to app rails-sample in org console / space development
as user@example.com... OK
```

## Unbind a service instance

### Unbind a service instance from an app

Unbinding a service instance from an app removes the credentials created for your app from the `VCAP_SERVICES` environment variable.

You must restart or in some cases re-push your app for changes to be applied to the `VCAP_SERVICES` environment variable and for the app to recognize these changes.

```
$ cf unbind-service my-app mydb
Unbinding app my-app from service mydb in org my-org / space test as user@example.com...
OK
```

### Unbind a service instance from a route

Unbinding a service instance from a route causes requests and responses to no longer be proxied through the service instance. For more information, see [Managing app requests with route services](#).

It's important to note that if your bound service instance is providing security features, like authorization, unbinding the service instance might leave your app vulnerable.

You do not have to restage your app.

```
$ cf unbind-route-service shared-domain.example.com --hostname my-app my-service-instance

Unbinding leaves apps mapped to route my-app.shared-domain.example.com vulnerable,
e.g. if service instance my-service-instance provides authentication. Do you want to proceed?> y

Unbinding route my-app.shared-domain.example.com from service instance my-service-instance in org my-org / space test as user@example.com...
OK
```

## Rename a service instance

You can change the name given to a service instance. Upon restarting any bound apps, the name of the instance changes in the `VCAP_SERVICES` environment variable. If your app depends on the instance name for discovering credentials, changing the name might break your app's use of the service instance.

```
$ cf rename-service mydb mydb1
Renaming service mydb to mydb1 in org my-org / space test as user@example.co
m...
OK
```

## Update a service instance

### Changing a service plan

*Changing a plan requires cf CLI v6.7+ and cf-release v192+. CLI v7 or v8 is recommended.*

By updating the service plan for an instance, you can change the service instance to other service plans. Though the platform and CLI now support this feature, services must implement support for it. Further, a service might support updating between some plans but not others. For example, a service might support updating a plan where only a logical change is required, but not where data migration is necessary. In either case, users can expect to see a meaningful error when plan update is not supported.

```
$ cf update-service mydb -p new-plan
Updating service instance mydb as user@example.com...
OK
```

### Arbitrary parameters

*Arbitrary parameters require cf CLI v6.12.1+*

Some services support additional configuration parameters with the update request. These parameters are passed in a valid JSON object containing service-specific configuration parameters, provided either in-line or in a file. For a list of supported configuration parameters, see documentation for the particular service offering.

```
$ cf update-service mydb -c '{"storage_gb":4}'
Updating service instance mydb as me@example.com...
```

```
$ cf update-service mydb -c /tmp/config.json
Updating service instance mydb as user@example.com...
```

### Instance tags

*Instance tags require cf CLI v6.12.1+*

Some services provide a list of tags that Cloud Foundry delivers in the `VCAP_SERVICES` environment variable. These tags provide developers with a more generic way for apps to parse `VCAP_SERVICES` for

credentials. Developers can provide their own tags when creating a service instance by including a comma-separated list of tags with the `-t` flag.

```
$ cf update-service my-db -t "staging, web"

Updating service my-db in org console / space development as user@example.co
m...
OK
```

## Upgrade a service instance



Upgrading a Service instance requires at least cf CLI v6.46.0+ and CAPI release 1.83.0+.

Some service brokers support upgrading service instances to the latest version of a service plan. For example, a broker might want to provide a way for users of the service to upgrade the underlying operating system that their service instances run on.

To upgrade your service instances:

1. Confirm that an upgrade is available by running `cf services` and reviewing the `upgrade available` column. For example:

```
$ cf services
Getting services in org acceptance / space dev as admin...

name      service    plan      bound apps   last operation   broker
upgrade available
mydb       p-mysql   small          create succeeded  mysql-brok
er     yes
otherdb    p-mysql   medium         create succeeded  mysql-brok
er     no
```

2. Upgrade the service instance using the `--upgrade` flag:

```
cf update-service SERVICE-INSTANCE-NAME --upgrade
```

For example:

```
$ cf update-service mydb --upgrade
You are about to update mydb.
Warning: This operation might run long and block further operations on
the service until complete.
Really update service mydb? [yN]: y
OK
```

## Delete a service instance

Deleting a service instance deprovisions the service instance and deletes all data associated with the service instance.

```
$ cf delete-service mydb
```

```
Are you sure you want to delete the service mydb ? y
Deleting service mydb in org my-org / space test as user@example.com...
OK
```

## Sharing service instances

Here are instructions for sharing service instances in your Cloud Foundry apps.

### About service instance sharing

Sharing a service instance among multiple spaces and across orgs allows apps to share databases, messaging queues, and other types of services. This eliminates the need for development teams to use service keys and user-provided services to bind their apps to the same service instance that was provisioned using the `cf create-service` command. Sharing service instances improves security and auditing, and provides a more intuitive user experience.

- Developers and administrators can share service instances between spaces in which they have the Space Developer role.
- Developers who have a service instance shared with them can only bind and unbind apps to that service instance. They cannot update, rename, or delete it.
- Developers who have a service instance shared with them can view the values of any configuration parameters that were used to provision or update the service instance.

For example, if two development teams have apps in their own spaces, and both apps want to send messages to each other using a messaging queue:

1. The development team in space A can create a new instance of a messaging queue service, bind it to their app, and share that service instance into space B.
2. A developer in space B can then bind their app to the same service instance, and the two apps can begin publishing and receiving messages from one another.

## Activating service instance sharing in Cloud Foundry

To activate service instance sharing, the platform operator must activate the `service_instance_sharing` flag in Cloud Foundry.

```
$ cf enable-feature-flag service_instance_sharing
```

## Sharing a service instance

You can share a service instance from one space to another if you have the Space Developer role in both spaces.

To share a service instance to another space, run the following Cloud Foundry Command Line Interface (cf CLI) command:

```
$ cf share-service SERVICE-INSTANCE -s OTHER-SPACE [-o OTHER-ORG]
```

- You cannot share a service instance into a space where a service instance with the same name already exists.
- To share a service instance into a space, the space must have access to the service and service plan of the service instance that you are sharing. Run the `cf enable-service-access` command to set this access.
- If you no longer have access to the service or service plan used to create your service instance, you cannot share that service instance.

## Get information about service instance sharing

To get information about service instance sharing on the originating space, run the following cf CLI command from that originating space:

```
cf service SERVICE-INSTANCE-NAME
```

For example:

```
$ cf service mydb

name:          mydb
service:       p-mysql
tags:
plan:          100mb
description:   mysql databases on demand been created by a platform.
documentation:
dashboard:
service broker: mysql-broker

shared with spaces:
org      space      bindings
org-1    space-1    0
org-1    space-2    2

Showing status of last operation from service my-service-3...

status:      create succeeded
message:     Operation succeeded
started:    2021-03-01T15:10:15Z
updated:    2021-03-01T15:10:17Z

bound apps:
name           binding name  status        message
my-music-app            create succeeded  Operation succeeded

No upgrade available for this service.
```

- For each of the spaces, the service instance is shared into the output. The output shows the number of bindings to apps of the service instance in that space.
- When the service instance is not shared, `This service is not currently shared` appears instead of `shared with spaces`.

If you run the command while targeting the space where the service instance is shared, you see the originating space and organization.

For example:

```
$ cf service mydb

name:                      mydb
shared from org/space:    acceptance / dev
service:                   p-mysql
tags:
plan:                      100mb
description:                mysql databases on demand been created by a platform.
documentation:
dashboard:
service broker:            mysql-broker

Showing status of last operation from service my-service-3...

status:        create succeeded
message:       Operation succeeded
started:      2021-03-01T15:10:15Z
updated:      2021-03-01T15:10:17Z

bound apps:
name          binding name   status           message
my-library-app          create succeeded  Operation succeeded

No upgrade available for this service.
```

In this case, no information about other spaces is exposed.

## Unsharing a service instance



Unsharing a service instance deletes all bindings to apps in the spaces it was shared into. This might cause apps to fail. Before unsharing a service instance, run the `cf service SERVICE-INSTANCE` command to find out how many bindings exist in the spaces the service instance is shared into.

You can unshare a service instance if you have the Space Developer role in the space where this service instance was shared from.

Developers cannot delete or rename a service instance until it is unshared from all spaces.

To unshare a service instance, run the following cf CLI command:

```
$ cf unshare-service SERVICE-INSTANCE -s OTHER-SPACE [-o OTHER-ORG] [-f]
```

The `-f` flag (optional) forces unsharing without confirmation.

## Security considerations

- **Service keys** cannot be created from a space that a service instance is shared into. This ensures that developers in the space where a service instance is shared from have visibility into where and how many times the service instance is used.
- Sharing service instances does not update app security groups (ASGs). The network policies defined in your ASGs might need to be updated to ensure that apps using shared service instances can access the underlying service.
- Access to a service must be activated using the `cf enable-service-access` command for a service instance to be shared into a space.
- Not all services are activated for sharing the instances capability. Contact the service vendor directly if you are unable to share instances of their service. If you are a service author, see [Enabling service instance sharing](#).

## Deactivating service instance sharing in Cloud Foundry

To deactivate service instance sharing, run:

```
$ cf disable-feature-flag service_instance_sharing
```

This only prevents new shares from being created. To remove existing shares, see [Deleting all shares](#).

## Deleting all shares

The following script finds all service instances that are shared, and for each space that the service instance is shared into, all service bindings to that service instance are deleted, and all shares are deleted.

If a service binding is not deleted, the script continues trying to unshare subsequent service instances.

To use this script, you must be logged in as an administrator and have jq installed.



This script was tested on macOS Sierra 10.12.4 and Ubuntu 14.04.5. Use the script at your own risk.

```
#!/usr/bin/env bash

set -u
set -e

# refresh auth token
cf oauth-token >/dev/null

for instance_guid in $(cf curl /v3/service_instances | jq -r '.resources[].guid'); do
```

```

for space_guid in $(cf curl /v2/service_instances/$instance_guid/shared_to | jq -r '.resources[].space_guid'); do
    echo "Unsharing service instance $instance_guid from space $space_guid"

    set +e
    cf curl -X DELETE "/v3/service_instances/$instance_guid/relationships/shared_spaces/$space_guid"
    set -e
done
done

```

## Delivering service credentials to an app

You can bind your apps to service instances for the purpose of generating credentials and delivering them to apps. For an overview of services, and documentation about other service management operations, see [Using services](#). If you are interested in building services for Tanzu Operations Manager and making them available to end users, see [Services](#).

### Bind a service instance

Binding a service instance to your app triggers credentials to be provisioned for the service instance and delivered to the app runtime in the `VCAP_SERVICES` environment variable. For details about consuming these credentials with your app, see [Using bound service instances](#).

Not all services support binding, as some services deliver value to users directly without integration with an app. In many cases, binding credentials are unique to an app, and another app bound to the same service instance receives different credentials, but this depends on the service.

```

$ cf bind-service my-app mydb
Binding service mydb to my-app in org my-org / space test as me@example.co
m...
OK
TIP: Use 'cf push' to ensure your env variable changes take effect

$ cf restart my-app

```



You must restart or in some cases re-push your app for changes to be applied to the `VCAP_SERVICES` environment variable and for the app to recognize these changes.

### Arbitrary parameters

Some services support additional configuration parameters with the bind request. These parameters are passed in a valid JSON object containing service-specific configuration parameters, provided either in-line or in a file. For a list of supported configuration parameters, see documentation for the particular service offering.

See the following examples:

```
$ cf bind-service rails-sample my-db -c '{"role":"read-only"}'
```

```
Binding service my-db to app rails-sample in org console / space development
as user@example.com...
OK
```

```
$ cf bind-service rails-sample my-db -c /tmp/config.json
```

```
Binding service my-db to app rails-sample in org console / space development
as user@example.com... OK
```

## Binding with app manifest

As an alternative to binding a service instance after pushing an app, you can use the app manifest to bind the service instance during `cf push`.

The following excerpt from an app manifest binds a service instance called `test-mysql-01` to the app on push.

```
services:
- test-mysql-01
```

The following excerpt from an app manifest binds a service instance called `db-test` with arbitrary parameters to the app on push. Arbitrary parameters used in this example are available in cf CLI 7.0 and later.

```
services:
- name: db-test
  parameters:
    schema: customschema
```

The following excerpt from the `cf push` command and response demonstrates that the cf CLI reads the manifest and binds the service instance to an app called `test-msg-app`.

```
$ cf push
Using manifest file /Users/Bob/test-apps/test-msg-app/manifest.yml

...
Binding service test-mysql-01 to test-msg-app in org My-Org / space development
as Bob@shared-domain.example.com
OK
```

For more information about app manifests, see [Deploying with app manifests](#).

## Named service bindings

Service offering and service instance names vary across environments. App authors can discover the service instances their apps require, without having to know environment-specific service names. Developers can specify a service binding name to include in `VCAP_SERVICES`.

To specify the service binding name, provide the `--binding-name` flag when binding an app to a service instance:

```
$ cf bind-service my-app my-service --binding-name postgres-database
OK
```

The provided name is available in the `name` and `binding_name` properties in the `VCAP_SERVICES` environment variable:

```
"VCAP_SERVICES": {
  "service-name": [
    {
      "name": "postgres-database",
      "binding_name": "postgres-database",
      ...
    }
  ]
}
```

## Using bound service instances

After your service instance is created and bound to your app, you must configure the app to dynamically fetch the credentials for your service instance. The `VCAP_SERVICES` environment variable contains credentials and additional metadata for all bound service instances. There are two methods developers can use to have their apps consume binding credentials.

- **Parse the JSON yourself:** See the documentation for `VCAP_SERVICES`. Helper libraries are available for some frameworks.
- **Auto-configuration:** Some buildpacks create a service connection for you by creating additional environment variables, updating config files, or passing system parameters to the JVM.

For details about consuming credentials specific to your development framework, see the Service Binding section in the documentation for your framework's [buildpack](#).

## Update service credentials

This section describes how to update service instance credentials. When updating the credentials, you can restart the app immediately and experience app downtime. If your app uses blue-green deployment, you can update service instance credentials with no downtime.

For more information about user-provided services, see [Update a user-provided service instance](#) in *User-Provided Service Instances*.

### With downtime

To update your service credentials:

1. **Unbind the service instance** using the credentials you are updating by running:

```
$ cf unbind-service YOUR-APP YOUR-SERVICE-INSTANCE
```

2. **Bind the service instance.** This command adds your credentials to the `VCAP_SERVICES` environment variable.

```
$ cf bind-service YOUR-APP YOUR-SERVICE-INSTANCE
```

3. Restart or re-push the app bound to the service instance so that the app recognizes your environment variable updates.

## Without downtime

To update your service credentials without experiencing app downtime:

1. Start a blue-green update of the app. For more information, see [Using blue-green deployment to reduce downtime and risk](#). Push the “Green” version of the app with the `--no-start` parameter to prevent the app from starting right away:

```
$ cf push YOUR-APP --no-start
```

2. Bind the service instances to the newly-deployed “Green” app by running:

```
$ cf bind-service YOUR-APP YOUR-SERVICE-INSTANCE
```

3. Start the “Green” app with `cf start`:

```
$ cf start YOUR-APP
```

4. Unbind the service instances from the `Blue` app:

```
$ cf unbind-service YOUR-APP YOUR-SERVICE-INSTANCE
```

## Unbind a service instance

Unbinding a service removes the credentials created for your app from the `VCAP_SERVICES` environment variable.

```
$ cf unbind-service my-app mydb
Unbinding app my-app from service mydb in org my-org / space test as me@example.com...
OK
```



You must restart or in some cases re-push your app for changes to be applied to the `VCAP_SERVICES` environment variable and for the app to recognize these changes.

## Managing service keys

Here are instructions for managing service instance credentials (binding credentials) with service keys.

Service keys generate credentials for manually configuring consumers of Marketplace services. After you configure them for your service, local clients, apps in other spaces, or entities outside your deployment can access your service with these keys.



Some service brokers do not support service keys. To build a service broker that supports service keys, see [Services](#). To use a service broker that does not support service keys,

see [Delivering service credentials to an app.](#)

## Create a service key

To generate credentials for a service instance, use the `cf create-service-key` command:

```
$ cf create-service-key MY-SERVICE MY-KEY
Creating service key MY-KEY for service instance MY-SERVICE as me@example.com...
OK
```

Use the `-c` flag to provide service-specific configuration parameters in a valid JSON object, either in-line or in a file.

To provide the JSON object in-line, use the following format:

```
$ cf create-service-key MY-SERVICE MY-KEY -c '{"read-only":true}'
Creating service key MY-KEY for service instance MY-SERVICE as me@example.com...
OK
```

To provide the JSON object as a file, give the absolute or relative path to your JSON file:

```
$ cf create-service-key MY-SERVICE MY-KEY -c PATH-TO-JSON-FILE
Creating service key MY-KEY for service instance MY-SERVICE as me@example.com...
OK
```

## List service keys for a service instance

To list service keys for a service instance, use the `cf service-keys` command:

```
$ cf service-keys MY-SERVICE
Getting service keys for service instance MY-SERVICE as me@example.com...
name
mykey1
mykey2
```

## Get credentials for a service key

To retrieve credentials for a service key, use the `cf service-key` command:

```
$ cf service-key MY-SERVICE MY-KEY
Getting key MY-KEY for service instance MY-SERVICE as me@example.com...
{
  uri: foo://user2:pass2@example.com/mydb,
```

```
servicename: mydb
}
```

Use the `--guid` flag to display the API GUID for the service key:

```
$ cf service-key --guid MY-SERVICE MY-KEY
Getting key MY-KEY for service instance MY-SERVICE as me@example.com...
e3696fcb-7a8f-437f-8692-436558e45c7b
OK
```

## Configure credentials for a service key

After obtaining these credentials, you can use a local CLI or utility to connect to the service instance, configure an app running outside the platform to connect to the service instance, or create a user-provided service instance so that apps in another space can connect to the service instance. How you configure these credentials depends on what local client, app, or entity is used to access your service instance.

For more information about configuring credentials with a user-provided service instance, see [User-provided service instances](#).

## Delete a service key

To delete a service key, use the `cf delete-service-key` command:

```
$ cf delete-service-key MY-SERVICE MY-KEY

Are you sure you want to delete the service key MY-KEY ? y
Deleting service key MY-KEY for service instance MY-SERVICE as me@example.co
m...
OK
```

Add option `-f` to force deletion without confirmation.

```
$ cf delete-service-key -f MY-SERVICE MY-KEY

Deleting service key MY-KEY for service instance MY-SERVICE as me@example.co
m...
OK
```

## Managing app requests with route services

You can bind a service instance to a route for the purpose of adding preprocessing to your Cloud Foundry app requests.



The procedures in this topic use the Cloud Foundry Command Line Interface (cf CLI). You can also manage route services using Apps Manager. For more information, see the [Manage Route Services](#) section of the *Managing your orgs and spaces using Apps Manager* topic.

Route services are a class of Marketplace Services that perform filtering or content transformation on app requests and responses. For more information about Marketplace Services, see [Managing services](#) and [User-provided service instances](#).

Route services exist to help remove the burden on developers who would otherwise have to implement these functions themselves. Popular use cases for route services include rate limiting, authorization, and caching. A route service might reject requests or, after some transformation, pass requests to apps.

To use route services, developers must first create a service instance, choosing from compatible Marketplace services. Developers then bind this service instance to a route, and all requests for the route are preprocessed by the service instance. While some services can support instances being bound to both routes and apps, these operations have different effects. For app requests and responses to be routed through a route service, the service instance must be bound to the route.

To view an example demonstrating the use of a sample route service, see [Route Services in Pivotal Cloud Foundry](#) on YouTube.

## Bind a route to a service instance

You must install the Cloud Foundry Command Line Interface (cf CLI) to bind a route to a service instance. For more information, see [Installing the cf CLI](#).



Gorouter rejects WebSocket requests for routes that are bound to route services. These requests return a 503 error and a `X-Cf-Routererror route_service_unsupported header`.

Run `cf bind-route-service` to bind a route from an app to a service instance.

The following example binds the route from `my-app.shared-domain.example.com` to the service instance `my-route-service`.

```
$ cf bind-route-service shared-domain.example.com my-route-service --hostname my-app
```

```
Binding route my-app.shared-domain.example.com to service instance my-route-service in org my-org / space my-space as developer...
OK
```



When binding a service instance to a route, Cloud Foundry might have proxy requests for the route to the service instance, or configure a network component already in the request path.

## Bind with parameters

Some services support additional configuration parameters supplied with the bind request. You can pass service-specific configuration parameters in a valid JSON object, provided either in-line or in a file. For a list of supported configuration parameters, see the documentation for the particular service offering you bind to.

This example binds the route from `my-app.shared-domain.example.com` to the service instance `my-route-service`, and passes configuration parameters in-line.

```
$ cf bind-route-service shared-domain.example.com my-route-service --hostname
my-app -c '{"rate_limit_threshold_rps":10000}'
```

```
Binding service my-db to app rails-sample in org console / space development
as user@example.com...
OK
```

This example binds the route from `my-app.shared-domain.example.com` to the service instance `my-route-service`, and passes configuration parameters in a file, `/tmp/config.json`.

```
$ cf bind-route-service shared-domain.example.com my-route-service --hostname
my-app -c /tmp/config.json
```

```
Binding route my-app.shared-domain.example.com to service instance my-route-s
ervice in org my-org / space my-space as developer...
OK
```

## Unbind a route from a service instance

You must install the Cloud Foundry Command Line Interface (cf CLI) to bind a route to a service instance. For more information, see [Installing the cf CLI](#).

Run the `cf unbind-route-service` command to unbind a route from an app to a service instance.

This example removes the route from `my-app.shared-domain.example.com` to the service instance `my-route-service`.

```
$ cf unbind-route-service shared-domain.example.com my-route-service --hostna
me my-app
```

```
Unbinding might leave apps mapped to route my-app.shared-domain.example.com v
ulnerable e.g. if service instance my-route-service provides authentication.
Do you want to proceed?> y
```

```
Unbinding route my-app.shared-domain.example.com from service instance my-rou
te-service in org my-org / space my-space as developer...
OK
```

## Configuring Play Framework service connections

Cloud Foundry provides support for connecting a Play Framework app to services such as MySQL and PostgreSQL. In many cases, a Play Framework app running on Cloud Foundry can detect and configure connections to services.

By default, Cloud Foundry detects service connections in a Play Framework app and configures them to use the credentials provided in the Cloud Foundry environment. Auto-configuration only happens if it's a single service for one of the supported types, MySQL or PostgreSQL.

## Using an external file system (volume services)

Here are instructions to help you read and write to a mounted file system from your apps. In VMware Tanzu Application Service for VMs (TAS for VMs), a volume service provides a volume so your app can read or write to a reliable, persistent file system.



If you are using VMware Tanzu Application Service for VMs [Windows], see [Using SMB Volumes in .NET Apps](#).

NFS is not available on Windows systems.

## Prerequisite

Before you can use a volume service with your app, find out if any volume services are available for your app.

1. Log in to the Cloud Foundry Command Line Interface (cf CLI). Run:

```
cf login
```

2. List available NFS volume services. Run:

```
cf marketplace
```

See the following example output of the NFS volume service:

```
cf marketplace
service    plans      description
nfs        Existing   Service for connecting to NFS volumes
```

3. Do one of the following:

- **If no NFS volume service exists:** If no volume service that fits your requirements exists, contact your Tanzu Operations Manager admin. For more information, see [Enabling Volume Services](#).
- **If an NFS volume service exists:** Continue to [Mount an external file system](#).

## Mount an external file system

The following sections describe how to mount an external file system to your app.

### Create and bind a service instance

To use a volume service deployed by your Tanzu Operations Manager admin, you must first create an instance of the specific volume service that you need.



You can also bind volume services using an app manifest. However, app manifests do not support bind configuration. To bind a volume service using an app manifest, you must specify bind configuration when you create the service instance. The releases that support this are `nfs-volume` v1.3.1 and later and `smb-volume` v1.0.0 and later. For more information, see [Services in Deploying with App Manifests](#).

To create and bind an instance for the volume service:

1. Create a service instance:
  - **NFS**: See [Create an NFS volume service](#).
  - **SMB**: See [Create an SMB volume service](#).
2. Bind your service instance to an app:
  - **NFS-only**: Bind an NFS service instance to an app. Run:

```
cf bind-service YOUR-APP SERVICE-NAME -c '{"mount":"OPTIONAL-MOUNT-PATH","readonly":true}'
```

The app file operations use the UID of the running app process. For buildpack apps, this UID is always `2000`. For Docker apps, the effective UID is the same as the UID of the process inside the Docker container, except for `root`, which is mapped to `4294967294` outside the Docker container.

Or to use UID/GID mapping:

```
cf bind-service YOUR-APP SERVICE-NAME -c '{"uid":"UID","gid":"GID","mount":"OPTIONAL-MOUNT-PATH","readonly":true}'
```

Where:

- `YOUR-APP` is the name of the app for which you want to use the volume service.
- `SERVICE-NAME` is the name of the volume service instance you created in an earlier step.
- (Optional) `UID` and `GID` are the UID and GID to use when mounting the share to the app. The `GID` and `UID` must be positive integer values greater than `0`. Provide the UID and GID as a JSON string in-line or in a file. If you omit `uid` and `gid`, the driver skips `mapfs` mounting and performs only the normal kernel mount of the NFS file system without the performance overhead associated with FUSE mounts.  
The key advantage of specifying `UID` and `GID` is that you can specify different values for different apps, so file permissions can be granted at the app level. If this is not needed, the you can eliminate the performance overhead of `mapfs` by managing permissions on the NFS server.
- The user specified by `uid` must have access to the files on the share. When `uid` and `gid` are omitted, the app file operations use the UID of the running app process. For buildpack apps, this UID is always `2000`. For Docker apps, the effective UID is the same as the UID of the process inside the Docker container, except for `root`, which is mapped to `4294967294` outside the Docker container.



Specifying UID and GID values affects performance because the FUSE file system mapfs is used to translate UID and GID values.

- (Optional) `OPTIONAL-MOUNT-PATH` is a JSON string that indicates that the volume must be mounted to a particular path in your app rather than the default path. Choose a path with a root-level directory that already exists in the container, such as `/home`, `/usr`, or `/var`.



Do not specify a `MOUNT-PATH` in the `/app` directory, which is where TAS for VMs unpacks the droplet. For more information, see [Mount a shared volume in the /app directory](#).

- (Optional) `"readonly":true` is a JSON string that creates a read-only mount. By default, Volume Services mounts a read-write file system. For read-only mounts, the driver activates attribute caching. This results in fewer attribute RPCs and better performance.

The following example shows binding `my-app` to the `nfs_service_instance` and specifying a read-only volume to be mounted to `/var/volume1`, passing an in-line JSON string:

```
cf bind-service my-app nfs_service_instance -c '{"uid":"1000","gid":"1000","mount":"/var/volume1","readonly":true}'
```

- **LDAP-only:** Bind an LDAP service to an app. Run:

```
cf bind-service YOUR-APP SERVICE-NAME -c '{"username":"USERNAME","password":"PASSWORD","mount":OPTIONAL-MOUNT-PATH,"readonly":true}'
```

Where:

- `YOUR-APP` is the name of the app for which you want to use the volume service.
- `SERVICE-NAME` is the name of the volume service instance you created in an earlier step.
- `USERNAME` and `PASSWORD` are the user name and password for the LDAP server. If you omit `username` and `password`, the driver skips `mapfs` mounting and performs only the normal kernel mount of the NFS file system without the overhead associated with FUSE mounts.
- (Optional) `OPTIONAL-MOUNT-PATH` is a JSON string that indicates the volume must be mounted to a particular path within your app rather than the default path. Choose a path with a root-level directory that already exists in the container, such as `/home`, `/usr`, or `/var`.



Do not specify a `MOUNT-PATH` within the `/app` directory, which is where TAS for VMs unpacks the droplet. For more information, see [Mount a shared volume in the /app directory](#).

- (Optional) `"readonly":true` is a JSON string that creates a read-only mount. By default, Volume Services mounts a read write file system. For read-only mounts,

the driver activates attribute caching. This results in fewer attribute RPCs and better performance.

3. Restage your app. Run:

```
cf restage YOUR-APP
```

Where `YOUR-APP` is the name of the app.

## Access the volume service from your app

To access the volume service from your app, you must know which file path to use in your code.

You can view the file path in the details of the service binding, which are available from the `VCAP_SERVICES` environment variable. See [VCAP\\_SERVICES](#).

To access the volume service from your app:

1. View environment variables for your app. Run:

```
cf env YOUR-APP
```

Where `YOUR-APP` is the name of your app.

The following is example output of the `cf env` command:

```
$ cf env YOUR-APP
"VCAP_SERVICES": {
  "nfs": [
    {
      "credentials": {},
      "label": "nfs",
      "name": "nfs_service_instance",
      "plan": "Existing",
      "provider": null,
      "syslog_drain_url": null,
      "tags": [
        "nfs"
      ],
      "volume_mounts": [
        {
          "container_dir": "/var/vcap/data/153e3c4b-1151-4cf7-b311-948dd77fce64",
          "device_type": "shared",
          "mode": "rw"
        }
      ]
    }
  ]
}
```

2. Use the properties under `volume_mounts` for any information your app needs.

Property	Description
<code>container_dir</code>	String containing the path to the mounted volume that you bound to your app.
<code>device_type</code>	The NFS volume release. This only supports <code>shared</code> devices. A <code>shared</code> device represents a distributed file system that can mount on all app instances simultaneously.
<code>mode</code>	String that informs what type of access your app has to NFS, either read-only, <code>ro</code> , or read and write, <code>rw</code> .

## Mount a shared volume in the `/app` directory

If you specify a mount inside the `/app` directory, the app might fail to start and parts of the app droplet can be written to the remote file share. This is because TAS for VMs mounts the volume before moving your compiled app into the droplet.

If your app requires the shared volume to be placed within the `/app` directory, you can use a symbolic link at app startup.

To mount a volume in the `/app` directory:

1. Specify a mount volume in a location outside of the `/app` directory.
2. Create a symbolic link at app startup time, prior to launching the app. For example, run:

```
cf push YOUR-APP -c "ln -s /var/volume1 /app/volume1 && \$HOME/boot.sh"
```

Where `YOUR-APP` is the name of the app.

## Create and use NFS volume services

This section describes how to use the NFS volume service.

TAS for VMs offers two NFS volume services:

- `nfs`: This volume service provides support for NFS volumes using both v3 and v4.x protocols.
- `nfs-legacy` (deprecated): Although it is deprecated, this volume service is still available due to the difficulty of retiring services. If you use this service, it performs exactly the same mount as the `nfs` service. For information about migrating to `nfs`, see [Migrate `nfs-legacy` Services to `nfs`](#).

Both services offer a single plan called `Existing`.



NFS is not available on Windows systems.

## Create an NFS volume service

To create an NFS volume service using the `Existing` plan of the `nfs` service:

1. Create an NFS volume service. Run:

```
cf create-service nfs Existing SERVICE-INSTANCE-NAME -c '{"share":"SERVER/SHARE", "version":"NFS-PROTOCOL"}'
```

Where:

- `SERVICE-INSTANCE-NAME` is a name you provide for this NFS volume service instance.
- `SERVER/SHARE` is the NFS address of your server and share.



Omit the `:` that usually follows the server name in the address.

- (Optional) `NFS-PROTOCOL` is the NFS protocol you want to use. For example, to use NFSv4, set the version to `4.1`. Valid values are `3`, `4.0`, `4.1` or `4.2`. If you do not specify a `version`, the protocol version used is negotiated between client and server at mount time. This usually causes the latest available version to be used.



Tanzu Application Service versions shipping with nfs-volume versions `v7.1.45` – `v7.1.47` or `v5.0.55` – `5.0.58` (as of 22 Feb., 2024: 2.11.52 - 2.11.53, 2.13.34 - 2.13.35, 4.0.15 - 4.0.17, 5.0.6 - 5.0.7) do not support specifying NFS `version`: `3.0`. These updated the contained nfs-utils (a dependency of nfs-volume-service) to a newer version that uses stricter option parsing. NFSv3 does not utilize a MINOR version, but NFSv4 introduced MINOR versions that can be specified. This has been mitigated by adding auto-correction logic to the nfsdriver process available with nfs-volume `>= v7.1.48` and `>= v5.0.59`.

2. Confirm that the NFS volume service appears in your list of services. Run:

```
cf services
```

## Migrate nfs-legacy services to nfs

With the release of NFS Volume Service v1.5.4, the original fuse-based NFS service is deprecated in favor of the later kernel mount-based NFS service. Existing NFS volume service bindings are listed as `nfs-legacy`.

To migrate from `nfs-legacy` to the later `nfs` service, VMware recommends that you recreate and re-bind your `nfs` service instances.

With the release of NFS Volume Service v2.0.0, the `nfs-legacy` service uses the `nfs` service. To avoid being affected when the `nfs-legacy` service is retired, recreate and re-bind your service instances using the `nfs` service.

## Deploy and bind a sample app

This section describes how to deploy a sample app and bind it to the NFS volume service.

To deploy and bind a sample app:

1. Clone the GitHub repository for the sample app into your workspace by running these commands:

```
cd ~/workspace
```

```
git clone https://github.com/cloudfoundry/cf-acceptance-tests.git
```

2. Change into the `cf-acceptance-tests/assets/pora/` directory:

```
cd ~/workspace/cf-acceptance-tests/assets/pora
```

3. Push the `pora` test app by running:

```
cf push pora --no-start
```

4. Bind the service to your app. Run:

```
cf bind-service pora SERVICE-INSTANCE-NAME -c '{"uid":"UID","gid":"GID"}'
```

Where:

- `SERVICE-INSTANCE-NAME`: The name of the volume service instance you created previously.
- `UID` and `GID`: The `UID` and `GID` to use when mounting the share to the app. The NFS driver uses these values in the following ways:
  - When sending traffic to the NFS server, the NFS driver translates the app user ID and group ID to the `UID` and `GID` values.
  - When returning attributes from the NFS server, the NFS driver translates the `UID` and `GID` back to the running user UID and default GID. This allows you to interact with your NFS server as a specific user while allowing TAS for VMs to run your app as an arbitrary user. `UID` and `GID` must be positive integer values.



In NFS v2.0.0 and later, `uid` and `gid` values of `0` are no longer permissible because of security concerns.

- (Optional) `mount`: Use this option to specify the path at which volumes mount to the application container. The default is an arbitrarily-named directory in `/var/vcap/data`. You can edit this value if your app has specific requirements. For example:

```
cf bind-service pora myVolume -c '{"mount":"/var/path"}'
```

- (Optional) `readonly`: When you run the `cf bind-service` command, Volume Services mounts a read-write file system by default. You can specify a read-only mount by adding `"readonly":true` to the bind configuration JSON string.
- (Optional) `cache`: When you run the `cf bind-service` command, Volume Services mounts the remote file system with attribute caching deactivated by default. You can activate attribute caching using default values by adding `"cache":true` to the bind configuration JSON string.

5. Start the app. Run:

```
cf start pora
```

6. Confirm the app is running. Run:

```
curl http://pora.YOUR-CF-DOMAIN.com
```

The command returns an instance index for your app.

7. Confirm the app can access the shared volume. Run:

```
curl http://pora.YOUR-CF-DOMAIN.com/write
```

The command writes a file to the share and then reads it back out again.

## Use NFS volume service

This section describes using the NFS volume service.

### Configure LDAP credentials with service instance creation

If your Operations Manager deployment has LDAP activated, you can configure LDAP credentials for your NFS Volume Service instance.

To configure LDAP credentials while creating your NFS Volume Service instance:

1. Specify values for `username` and `password` in the JSON string for your `cf create-service` command:

```
cf create-service nfs PLAN SERVICE-INSTANCE-NAME -c '{"share": "SERVER/SHARE", "username": "USERNAME", "password": "PASSWORD"}'
```

Where:

- `PLAN` is the name of the service plan.
- `SERVICE-INSTANCE-NAME` is a name you provide for this NFS Volume Service instance.
- `SERVER/SHARE` is the NFS address of your server and share.
- `USERNAME` is a user name you provide for this NFS Volume Service instance.
- `PASSWORD` is a password you provide for this NFS Volume Service instance.

### Specify bind parameters during service instance creation

As of `nfs-volume-release` v1.3.1, you can specify bind parameters in advance, when you create a service instance. Use this option if you bind the service to your app in an app manifest, where bind configuration is not supported.

### File locking with `flock()` and `lockf()/fcntl()`

Apps that use file locking through UNIX system calls such as `flock()` and `fcntl()` or script commands such as `flock` to use the `nfs` service. The `nfs-legacy` service uses a fuse mounting process that does not enforce locks across Diego Cells.

### Hard links in the NFS service

The mapfs UID mapping layer used by the NFS service does not support hard link operations. You get a `Function not implemented` error if you try to create a hard link in an NFS share when `uid` or `username` is specified for the service.

Workarounds for this issue:

- Use symbolic links, `ln -s`, instead of hard links.
- Omit the `uid` and `gid` or the `username` and `password` parameters to mount the share without UID mapping. For this workaround, the app user must have access to the files on the share.

## Create and use SMB volume services

This section describes how to use a Server Message Block (SMB) volume service. For more information about SMB volume services, see the [Microsoft documentation](#) in the Microsoft documentation.



If you are using VMware Tanzu Application Service for VMs [Windows], see [Using SMB Volumes in .NET Apps](#).

### Create an SMB volume service

TAS for VMs offers an `smb` volume service. This volume service provides support for existing SMB shares.

The service offers a single plan called `Existing`.

To create an SMB volume service:

1. Create the service by running:

```
cf create-service smb Existing SERVICE-INSTANCE-NAME -c '{"share": "//SERVER/SHARE", "version": "SMB-VERSION"}'
```

Where:

- `SERVICE-INSTANCE-NAME` is a name you provide for this SMB volume service instance.
- `//SERVER/SHARE` is the SMB address of your server and share.
- (Optional) `SMB-VERSION` is the SMB protocol version you want to use. For example, to use SMB 2.1, set the version to `2.1`. Valid values are `1.0`, `2.0`, `2.1`, or `3.0`, `3.1.1`. If you do not specify a `version`, the client and server negotiate a protocol version at mount time. The client and server usually select the latest available version. `3.1.1` is supported as of [v3.2.0 smb-volume-release](https://github.com/cloudfoundry/smb-volume-release/releases/tag/v3.2.0).

2. Confirm that the SMB volume service appears in your list of services. Run:

```
cf services
```

### Deploy and bind a sample app

This section describes how to deploy a sample app and bind it to the SMB volume service.

To deploy and bind a sample app:

- Clone the GitHub repository for the sample app into your workspace. Run:

```
cd ~/workspace
```

```
git clone https://github.com/cloudfoundry/cf-acceptance-tests.git
```

- Change into the `cf-acceptance-tests/assets/pora/` directory:

```
cd ~/workspace/cf-acceptance-tests/assets/pora
```

- Push the `pora` test app. Run:

```
cf push pora --no-start
```

- Bind the service to your app. Run:

```
cf bind-service pora SERVICE-INSTANCE-NAME -c '{"username":"USERNAME","password":"PASSWORD"}'
```

Where:

- `SERVICE-INSTANCE-NAME`: The name of the volume service instance you created previously.
- `USERNAME` and `PASSWORD`: The user name and password to use when mounting the share to the app. This allows you to interact with your SMB server as a specific user while allowing TAS for VMs to run your app as an arbitrary user.
- (Optional) `mount`: Use this option to specify the path at which volumes mount to the application container. The default is an arbitrarily-named directory in `/var/vcap/data`. You can edit this value if your app has specific requirements. For example, run:

```
cf bind-service pora myVolume -c '{"username":"some-user","password":"some-password","mount":"/var/path"})'
```

- (Optional) `readonly`: When you run the `cf bind-service` command, Volume Services mounts a read-write file system by default. You can specify a read-only mount by adding `"readonly":true` to the bind configuration JSON string.
- (Optional) `domain`: If you use a Windows domain, you can specify a `domain` parameter.

- Start the app. Run:

```
cf start pora
```

- Confirm the app is running. Run:

```
curl http://pora.YOUR-CF-DOMAIN.com
```

The command returns an instance index for your app.

- Confirm the app can access the shared volume. Run:

```
curl http://pora.YOUR-CF-DOMAIN.com/write
```

The command writes a file to the share and then reads it back out again.

## User-provided service instances

User-provided service instances allow you to use services that are not available in the Marketplace with their apps running on Cloud Foundry.

You can use user-provided service instances to deliver service credentials to an app, or to trigger streaming of app logs to a syslog-compatible consumer. These two functions can be used individually or both at the same time.



The procedures in this topic use the Cloud Foundry Command Line Interface (cf CLI). You can also create user-provided service instances in Apps Manager from the Marketplace. To update existing user-provided service instances, navigate to the service instance page and select the **Configuration** tab.

After creation, user-provided service instances behave like service instances created through the Marketplace. See [Managing service instances](#) and [App binding](#) for details about listing, renaming, deleting, binding, and unbinding service instances.

## Create a user-provided service instance

The alias for the `cf create-user-provided-service` command is `cf cups`.

### Deliver service credentials to an app

Suppose a developer obtains a URL, port, user name, and password for communicating with an Oracle database managed outside of Cloud Foundry. The developer can manually create custom environment variables to configure their app with these credentials (of course you never hard code these credentials in your app!).

User-provided service instances allow developers to configure their apps with these using the familiar [App binding](#) operation and the same app runtime environment variable used by Cloud Foundry to deliver credentials for Marketplace services ([VCAP\\_SERVICES](#)).

```
cf cups SERVICE_INSTANCE -p '{"username": "admin", "password": "pa55woRD"}'
```

To create a service instance in interactive mode, use the `-p` option with a comma-separated list of parameter names. The Cloud Foundry Command Line Interface (cf CLI) prompts you for each parameter value.

```
$ cf cups my-user-provided-route-service -p "host, port"
host> rdb.local
port> 5432
```

```
Creating user provided service my-user-provided-route-service in org my-org /
space my-space as user@example.com...
OK
```

After creating the user-provided service instance, to deliver the credentials to one or more apps, see [App binding](#).

## Stream app logs to a service

User-provided service instances allow developers to stream app logs to a syslog compatible aggregation or analytics service that isn't available in the Marketplace. For more information about the syslog protocol see [RFC 5424](#) and [RFC 6587](#).



RFC-5424 is used to establish connections over HTTP/HTTPS. RFC-6587 is used for TCP based communication over syslog/syslog-tls drains.

Create the user-provided service instance, specifying the URL of the service with the `-l` option.

```
cf cups SERVICE_INSTANCE -l syslog-tls://example.log-aggregator.com:6514
```

To stream app logs to the service, bind the user-provided service instance to your app.

## Proxy app requests to a route service

User-provided service instances allow developers to proxy app requests to [route services](#) for preprocessing. To create a user-provided service instance for a route service, specify the URL for the route service using the `-r` option.

```
$ cf create-user-provided-service my-user-provided-route-service -r https://my-route-service.example.com
Creating user provided service my-user-provided-route-service in org my-org /
space my-space as user@example.com...
OK
```



When creating the user-provided service, the route service URL you specify must be "https."

To proxy requests to the user-provided route service, you must bind the service instance to the route. For more information, see [Managing app requests with route services](#).

## Update a user-provided service instance

You can use `cf update-user-provided-service` to update the attributes of an instance of a user-provided service. New credentials overwrite old credentials, and parameters that are not provided are deleted.

The alias for `update-user-provided-service` is `uups`. Bound apps can access the new configuration after restart. You can use rolling restarts to avoid any app downtime. For more information, see [Restart an app](#) in [Rolling App Deployments](#).



If you are rotating credentials, the old credentials must be active until the restart is finished.

## Streaming app logs

In this section:

- [Streaming app logs to Log Management Services](#)
- [Streaming app logs to third-party services](#)
- [Streaming app logs to Splunk](#)
- [Streaming app logs with Fluentd](#)
- [Streaming app logs to Azure OMS Log Analytics](#)
- [Using metrics with drain logs](#)

## Streaming app logs to Log Management Services

Here are instructions for draining logs from Cloud Foundry to a third-party log management service.

Cloud Foundry aggregates logs for all instances of your apps and for requests made to your apps through internal components of Cloud Foundry. For example, when the Cloud Foundry router forwards a request to an app, the router records that event in the log stream for that app. To access the log stream for an app in the terminal, run:

```
$ cf logs YOUR-APP-NAME
```

If you want more than the limited amount of logging information that Cloud Foundry can buffer to persist, drain these logs to a log management service.

Since the release of [CAPI release 1.143.0](#), you can use mTLS inside your syslog drain. Follow the procedure in [Step 2: Create and Bind a User-Provided Service Instance](#). Include the corresponding credentials as a *PEM-encoded X.509 certificate*.

For more information about the systems responsible for log aggregation and streaming in Cloud Foundry, see [App logging in Cloud Foundry](#).

## Using services from the Cloud Foundry Marketplace

Your Cloud Foundry Marketplace offers one or more log management services. To use one of these services, create an instance of the service and bind it to your app by running:

```
$ cf create-service SERVICE PLAN SERVICE-INSTANCE
$ cf bind-service YOUR-APP YOUR-LOG-STORE
```

For more information about service instance life cycle management, see [Managing service instances](#).

Not all Marketplace services support syslog drains. Some services implement an integration with Cloud Foundry that allows automated streaming of app syslogs. If you are interested in building services for Tanzu Operations Manager and making them available to end users, see [Services](#).

# Using services not available in your Marketplace

If a compatible log management service is not available in your Cloud Foundry Marketplace, you can use user-provided service instances to stream app logs to a service of your choice. For more information, see the [Stream app logs to a service](#) in *User-provided service instances*.

You might need to prepare your log management service to receive app logs from Cloud Foundry. For specific instructions for several popular services, see [Service-specific instructions for streaming app logs](#). If you cannot find instructions for your service, follow the generic instructions.

## Step 1: Configure the log management service

To set up a communication channel between the log management service and your Cloud Foundry deployment:

1. Obtain the external IP addresses that your Tanzu Operations Manager admin assigns to outbound traffic.
2. Provide these IP addresses to the log management service. The specific steps to configure a third-party log management service depend on the service.
3. Add these IP addresses to your allowlist to ensure unrestricted log routing to your log management service.
4. Record the syslog URL provided by the third-party service. Third-party services typically provide a syslog URL to use as an endpoint for incoming log data. You use this syslog URL in [Step 2: Create and bind a user-provided service instance](#). If the URL is an IP address, then it must not contain any leading zeros, for example, `10.0.01.14`. If you include the leading zeros, then URL parsing fails.

Cloud Foundry uses the syslog URL to route messages to the service. The syslog URL has a scheme of `syslog`, `syslog-tls`, or `https`, and can include a port number. For example:

```
syslog://logs.example.com:1234
```

Because http drains are slow and resource intensive, we recommend using syslog drains instead.

## Step 2: Create and bind a user-provided service instance

You can create a syslog drain service and bind apps to it using Cloud Foundry Command Line Interface (cf CLI) commands.

1. To create the service instance, run `cf create-user-provided-service` (or `cf cups`) with the `-l` flag.

```
$ cf create-user-provided-service DRAIN-NAME -l SYSLOG-DRAIN-URL
```

Where:

- `DRAIN-NAME` is a name to use for your syslog drain service instance.
- `SYSLOG-DRAIN-URL` is the syslog URL from [Step 1: Configure the Log Management Service](#).

By default, the syslog agent forwards only application logs to a syslog server. To have the application container metrics like CPU, memory, or disk usage forwarded as well, use the `drain-`

`data` parameter to specify if only logs (default), only container metrics, only traces (timers from the Loggregator v2 API specification), or all of them are forwarded by the syslog drain. Add the `drain-data` parameter to the `SYSLOG-DRAIN-URL`.

```
$ cf create-user-provided-service DRAIN-NAME -l SYSLOG-URL?drain-data=DRAIN-DATA-VALUE
```

Where `DRAIN-DATA-VALUE` is one of the following:

- `logs` forwards logs only (this is the default when the parameter is not present).
- `metrics` forwards container metrics only.
- `traces` forwards traces only.
- `all` forwards logs, container metrics, and traces (timers).

Example: Forward container metrics:

```
$ cf create-user-provided-service my_app_drain -l syslog://logs.example.com:1234?drain-data=metrics
```

The deprecated parameters `drain-type` and `include-metrics-deprecated` are still available, but are solely for backward compatibility. The existing drains must not be recreated, and the possible automation on the consumer's side must not be adjusted.

The valid values for the `drain-type` parameter are:

- `logs` forwards logs only (this is the default when the parameter is not present)
- `metrics` forwards container metrics only
- `all` forwards both logs and metrics

It's important to note that the `drain-data` parameter has precedence over `drain-type` parameter. If the `include-metrics-deprecated` parameter is present in the Syslog URL, the drain forwards logs, application container metrics, and traces.

If you are using the mTLS feature delivered in [CAPI release 1.143.0](#), you can use the `-p` flag to define the client certificate and key as credentials, filling in values as follows.

```
$ cf create-user-provided-service DRAIN-NAME -l SYSLOG-URL -p '{"cert": "-----BEGIN CERTIFICATE-----\nMIID...-----END CERTIFICATE-----", "key": "-----BEGIN PRIVATE KEY-----\nMIIE...-----END PRIVATE KEY-----"}
```

If your certs include the V3 extension [X509v3 Extended Key Usage](#), ensure that you are using the right key policies. For TLS, you need server authentication, and for mTLS, you also need client authentication. For example, TLS Web Server Authentication for TLS with TLS Web Client Authentication for mTLS is defined as follows:

X509v3 extensions:

X509v3 Extended Key Usage:

TLS Web Server Authentication, TLS Web Client Authentication

You can also provide a single certificate authority without a client certificate and key if you are using a server certificate signed by your private CA.

```
$ cf create-user-provided-service DRAIN-NAME -l SYSLOG-URL -p '{"ca": "-  
----BEGIN CERTIFICATE----\nMIID...-----END CERTIFICATE----"}'
```

A combination of the approaches described earlier uses a certificate authority for a server certificate signed by your private ca and a client certificate and key.

```
$ cf create-user-provided-service DRAIN-NAME -l SYSLOG-URL -p '{"ca": "-  
----BEGIN CERTIFICATE----\nMIID...-----END CERTIFICATE----", "cer  
t": "-----BEGIN CERTIFICATE----\nMIID...-----END CERTIFICATE----", "ke  
y": "-----BEGIN PRIVATE KEY----\nMIIE...-----END PRIVATE KEY----"}'
```

For more information, see [User-provided service instances](#).

2. To bind an app to the service instance, do one of these:

- Run `cf push` with a manifest. The services block in the manifest must specify the service instance that you want to bind.
- Run `cf bind-service`:

```
cf bind-service YOUR-APP-NAME DRAIN-NAME
```

After a short delay, logs start to flow.

For more information, see [Managing service instances with the CLI](#).

## Step 3: Verify that logs are draining

To verify that logs are draining correctly to a third-party log management service:

1. Take actions that produce log entries, such as making requests of your app.
2. Compare the logs displayed in the CLI against those displayed by the log management service.

For example, if your app serves webpages, you can send HTTP requests to the app. In Cloud Foundry, these generate Router log entries, which you can view in the CLI. Your third-party log management service must display corresponding messages.

For security reasons, Cloud Foundry apps do not respond to `ping`. You cannot use `ping` to generate log entries.

## Streaming app logs to third-party services

Here are instructions for configuring some third-party log management services for your Cloud Foundry apps.

After you configure a service, see [Third-party log management services](#) for instructions for binding your app to the service.

**Logit.io**

From your Logit.io dashboard:

1. Identify the Logit ELK stack you want to use.
2. Click **Logstash Configuration**.
3. Note your Logstash **Endpoint**.
4. Note your TCP-SSL, TCP, or UDP **Port** (not the syslog port).
5. Create the log drain service in Cloud Foundry.

```
$ cf cups logit-ssl-drain -l syslog-tls://ENDPOINT:PORT
```

or

```
$ cf cups logit-drain -l syslog://ENDPOINT:PORT
```

6. Bind the service to an app.

```
$ cf bind-service YOUR-CF-APP-NAME logit-ssl-drain
```

or

```
$ cf bind-service YOUR-CF-APP-NAME logit-drain
```

7. Restage or push the app using one of these commands:

```
$ cf restage YOUR-CF-APP-NAME
```

```
$ cf push YOUR-CF-APP-NAME
```

After a short delay, logs begin to appear in Kibana.

## Papertrail

From your Papertrail account:

1. Click **Add System**. The Dashboard appears.
2. Click the **Other** link. The **Setup Systems** screen appears.
3. Click **I use Cloud Foundry**, enter a name, and click **Save**.

**Choose your situation:**

- A My syslogd only uses the default port**  
GNU syslogd and some embedded devices will only log to port 514. A few old Linux distro versions use GNU syslogd (mostly CentOS and Gentoo).
- B I use Cloud Foundry**  
Register each app separately. Use Heroku? [Here's how.](#)
- C My system's hostname changes**  
In rare cases, one system may change hostnames frequently. For example, a roaming laptop which sets its hostname based on DHCP (and roams across networks).

We'll provide an app-specific syslog drain and step-by-step setup for [Cloud Foundry](#).

Let's create a destination for this app.

**What should we call it?**

CloudFoundry

Alphanumeric. Does not need to match app name.

**Save →**

- After the system is recorded, the URL, with the port, is displayed. Record the URL and port for later use.

CloudFoundry will log to `logs.papertrailapp.com:36129`.

- Create the log drain service in Cloud Foundry.

```
$ cf cups my-logs -l syslog-tls://logs.papertrailapp.com:PORT
```

- Bind the service to an app.

```
$ cf bind-service APPLICATION-NAME my-logs
```

- Restage the app.

```
$ cf restage APPLICATION-NAME
```

After a short delay, logs begin to flow.

- When Papertrail starts receiving log entries, the view changes to show the logs viewing page.

```

All Systems Dashboard Events Account Help Me

Skipping auto-reconfiguration.
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: Mar 05, 2014 10:57:36 PM
org.cloudfoundry.reconfiguration.AbstractServiceConfigurer configure
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: INFO: No beans of type org.springframework.data.mongodb.MongoDbFactory found in application context. Skipping auto-reconfiguration.
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: Mar 05, 2014 10:57:36 PM
org.cloudfoundry.reconfiguration.AbstractServiceConfigurer configure
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: INFO: No beans of type org.springframework.data.redis.connection.RedisConnectionFactory found in application context. Skipping auto-reconfiguration.
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: Mar 05, 2014 10:57:36 PM
org.cloudfoundry.reconfiguration.AbstractServiceConfigurer configure
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: INFO: Class org.springframework.amp.rabbit.connection.ConnectionFactory not in classpath. Skipping auto-reconfiguration for it
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,680 INFO RequestMappingHandlerMapping:181 - Mapped "={"/albums/{id}}",methods=[DELETE],params=[],headers[],consumes[],produces[],custom[]" onto public void org.cloudfoundry.samples.music.web.controllers.AlbumController.deleteById(java.lang.String)
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,681 INFO RequestMappingHandlerMapping:181 - Mapped "={"/albums/{id}}",methods=[GET],params[],headers[],consumes[],produces[],custom[]" onto public org.cloudfoundry.samples.music.domain.Album
org.cloudfoundry.samples.music.web.controllers.AlbumController.getById(java.lang.String)
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,681 INFO RequestMappingHandlerMapping:181 - Mapped "={"/albums"},methods=[GET],params[],headers[],consumes[],produces[],custom[]" onto public java.util.List<org.cloudfoundry.samples.music.domain.Album>
org.cloudfoundry.samples.music.web.controllers.AlbumController.albums()
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,682 INFO RequestMappingHandlerMapping:181 - Mapped "={"/albums"},methods=[PUT],params[],headers[],consumes[],produces[],custom[]" onto public org.cloudfoundry.samples.music.domain.Album
org.cloudfoundry.samples.music.web.controllers.AlbumController.add(org.cloudfoundry.samples.music.domain.Album)
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,682 INFO RequestMappingHandlerMapping:181 - Mapped "={"/albums"},methods=[POST],params[],headers[],consumes[],produces[],custom[]" onto public org.cloudfoundry.samples.music.domain.Album
org.cloudfoundry.samples.music.web.controllers.AlbumController.update(org.cloudfoundry.samples.music.domain.Album)
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,684 INFO RequestMappingHandlerMapping:181 - Mapped "={"/info"},methods=[],params[],headers[],consumes[],produces[],custom[]" onto public org.cloudfoundry.samples.music.domain.ApplicationInfo
org.cloudfoundry.samples.music.web.controllers.InfoController.info()
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,684 INFO RequestMappingHandlerMapping:181 - Mapped "={"/service"},methods[],params[],headers[],consumes[],produces[],custom[]" onto public
java.util.List<org.springframework.cloud.service.ServiceInfo>
org.cloudfoundry.samples.music.web.controllers.InfoController.showServiceInfo()
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,684 INFO RequestMappingHandlerMapping:181 - Mapped "[/{env}],methods=[],params[],headers[],consumes[],produces[],custom[]" onto public
java.util.Map<java.lang.String, java.lang.String>
org.cloudfoundry.samples.music.web.controllers.InfoController.showEnvironment()
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,704 INFO SimpleUrlHandlerMapping:382 - Root mapping to handler of type [class org.springframework.web.servlet.mvc.ParameterizableViewController]
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,726 INFO SimpleUrlHandlerMapping:315 - Mapped URL path [/assets/**] onto
handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
Mar 05 14:57:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:36,731 INFO SimpleUrlHandlerMapping:315 - Mapped URL path [/**] onto
handler of type [class org.springframework.web.servlet.resource.DefaultServletHttpRequestHandler]
Mar 05 14:57:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: 22:57:37,040 INFO DispatcherServlet:480 - FrameworkServlet 'appServlet': initialization completed in 989 ms
Mar 05 14:57:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: Mar 05, 2014 10:57:37 PM org.apache.coyote.AbstractProtocol start
Mar 05 14:57:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: INFO: Starting ProtocolHandler ["http-bio-62939"]
Mar 05 14:57:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: Mar 05, 2014 10:57:37 PM org.apache.catalina.startup.Catalina start
Mar 05 14:57:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{App/1}: INFO: Server startup in 11278 ms
Mar 05 14:59:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{API}: Tried to stop app that never received a start event
Mar 05 14:59:36 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{API}: Updated app with guid 4aa8c960-c093-4bbb-8718-186f147f3e73 ({"instances":>1})
Mar 05 14:59:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{DEA}: Stopping app instance (index 1) with guid 4aa8c960-c093-4bbb-8718-186f147f3e73
Mar 05 14:59:37 Cloud@foundry 4aa8c960-c093-4bbb-8718-186f147f3e73/{DEA}: Stopped app instance (index 1) with guid 4aa8c960-c093-4bbb-8718-186f147f3e73

```

Example: "access denied" (1.2.3.4 OR redis) -sshd  
[https://papertrailapp.com/groups/553803/events?centered\\_on\\_id=378003402845892611&q=program%3A4aa8c960-c093-4bbb-8718-186f147f3e73%2F5BApp%2F1kSD](https://papertrailapp.com/groups/553803/events?centered_on_id=378003402845892611&q=program%3A4aa8c960-c093-4bbb-8718-186f147f3e73%2F5BApp%2F1kSD)

## Splunk

See Streaming app logs to splunk for details.

## Splunk Storm

From your Splunk Storm account:

1. Click **Add project**. On the dialog box that appears, enter the **Project name** and select the **Project time zone**. Click **Continue**.

## Add project

\* Project name

\* Project time zone

The Storm interface will use this time zone. If data you send to this project does not have a time zone already, it will be assigned this timezone by default [Learn More](#)

[Cancel](#) [Continue](#)

2. In **Network data**, create a new input. Under **Network data**, click **Select**. Data is sent directly from your servers, and accepted data types include syslog, syslog-*ng*, snare, and netcat.

 **Network data** [Learn more](#)

- Sends directly from your servers
- Accepts syslog, syslog-*ng*, rsyslog, snare, netcat, etc.
- Works with Heroku drain

[Select](#)

3. Under **Add network data**, click **Authorize your IP address** and select **Manually**. Next, enter the external IP addresses your Cloud Foundry administrator assigns to outbound traffic.

## Add network data

Storm can receive data from any network port. For example, Storm can accept remote data from [syslog](#), [rsyslog](#), [syslog-\*ng\*](#), [snare](#), [netcat](#) or any other application that transmits via TCP or UDP. [Learn more](#)

[Authorize your IP address](#)

[Automatically](#)

[Manually](#)

4. Record the host and port provided for TCP input for later use.

## Authorized network inputs

Storm can receive data from any network port. For example, Storm can accept remote data from [syslog](#), [rsyslog](#), [syslog-\*ng\*](#), [snare](#), [netcat](#) or any other application that transmits via TCP or UDP.

1. Authorize your IP address	2. Send data to these ports for this project only
<a href="#">Authorize automatically</a> Authorize all IP addresses sending data to this project within the next 15 min.	TCP <input type="text" value="tcp.k22g-wt6r.data.splunkstorm.com:15486"/>
<a href="#">Authorize manually</a> Specify the IP address	UDP <input type="text" value="udp.k22g-wt6r.data.splunkstorm.com:15486"/>

- Using the cf CLI, create the log drain service in Cloud Foundry using the TCP host and port you recorded. Then you bind the service to an app and restage the app using the syntax shown here. After a short delay, the logs begin to flow.

```
$ cf cups my-logs -l syslog://HOST:PORT
$ cf bind-service APPLICATION-NAME my-logs
$ cf restage APPLICATION-NAME
```

- When events begin to appear, click **Data Summary**. The **Data Summary** button appears in the **What to Search** section.

The screenshot shows a summary of indexed events. It displays '266 Events INDEXED' on the left, 'a minute ago EARLIEST EVENT' in the center, and 'a few seconds ago LATEST EVENT' on the right. Below these statistics is a prominent 'Data Summary' button.

- In the **Data Summary** table, click the **loggregator** link to view all incoming log entries from Cloud Foundry.

The screenshot shows a table titled 'Data Summary' with three tabs: 'Hosts (1)', 'Sources (1)', and 'Sourcetypes (1)'. A 'filter' input field is present above the table. The table has four columns: Host, Count, and Last Update. There is one entry for 'loggregator' with a count of 26 and a last update time of 3/7/14 3:26:01.000 PM.

## SumoLogic

SumoLogic uses HTTPS for communication. HTTPS is supported in Cloud Foundry v158 and later.

In your SumoLogic account:

- Beside **Manage Collectors and Sources**, click the **Add Collector** link.

The screenshot shows the 'Manage Collectors and Sources' page with a header containing 'Manage Collectors and Sources', 'Upgrade Collectors', 'Add Collector', and 'Access Keys'. The 'Add Collector' link is highlighted.

- Under **Add Collector**, select **Hosted Collector** and fill in the details.
  - In **Name**, enter `Cloud Foundry`.
  - In **Description**, enter the purpose of the new collector.
  - In **Category**, you can enter the source category, if you want. The collector sets the source category to this value unless it is overwritten by the source metadata.

**Select a type of collector:**

- Installed Collector**: Select to install a Collector in your deployment.
- Hosted Collector**: Select to set up a Collector in the Sumo Logic Cloud.

**FAQs**

- ▶ What's the difference between an Installed and Hosted Collector?
- ▶ Where should I install an Installed Collector?
- ▶ How do I know if I need more than one Installed Collector?
- ▶ Where does my data go?

**Add Collector**

**Name \***

**Description**

**Category**

Unless overwritten by Source metadata, the Collector will set the Source category of all messages to this value.

**Save** | [Cancel](#)

3. Click **Save**.
4. In the **Manage Collectors and Sources** table, in the row for the new collector, click the **Add Source** link.

<b>Manage Collectors and Sources</b>						
<a href="#">Upgrade Collectors</a>   <a href="#">Add Collector</a>   <a href="#">Access Keys</a>						
Name	Type	Status	Source Category	Sources	Last Hour	Messages
▼ Cloud Foundry	Hosted			1	None	<a href="#">Add Source</a>   <a href="#">Edit</a>   <a href="#">Delete</a>

5. Under **Select a type of Source**, select **HTTP** and fill in the details. An HTTPS URL is provided.
  1. In **Name**, leave the entry, `Cloud Foundry`.
  2. In **Description**, enter a description of the source.
  3. In **Source Host**, enter the host name for the system from which the log files are being collected.
  4. In **Source Category**, enter the log category metadata. You can use this later in queries.

Select a type of Source:

 <b>Amazon S3</b> Collects logs from an Amazon S3 bucket.	 <b>HTTP</b> HTTP receiver that collects logs sent to a specific address.
-----------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Name*</b> <input type="text" value="CloudFoundry"/> Maximum name length is 128 characters
<b>Description</b> <input type="text"/>
<b>Source Host</b> <input type="text"/> Host name for the system from which the log files are being collected, e.g. LDAP_Server
<b>Source Category</b> <input type="text"/> Log category metadata to use later for querying, e.g. OS_Security
<b>Advanced</b> <input checked="" type="checkbox"/>
<b>Filters</b> <input type="checkbox"/>
<a href="#" style="border: 1px solid #ccc; padding: 2px 10px;">Save</a>   <a href="#" style="color: #ccc;">Cancel</a>

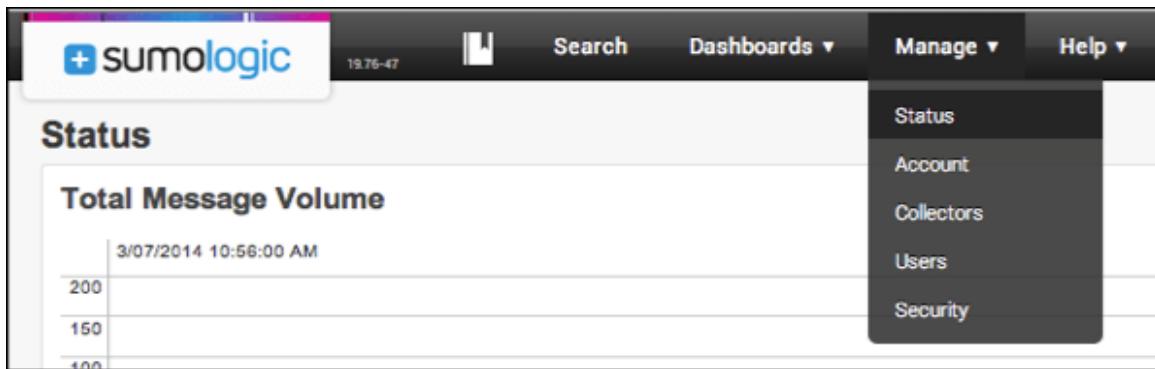
- When the source is created, a URL is displayed. You can also view the URL by clicking the **Show URL** link beside the newly created source in the **Manage Collectors and Sources** table. Record the URL for the next step.

<b>Manage Collectors and Sources</b>						
<a href="#">Upgrade Collectors</a> <a href="#">Add Collector</a> <a href="#">Access Keys</a>						
<a href="#">Show: All Collectors</a>   <a href="#">Running Collectors</a>   <a href="#">Stopped Collectors</a> <a href="#">Expand: All</a>   <a href="#">None</a>						
Name	Type	Status	Source Category	Sources	Last Hour	Messages
▼ Cloud Foundry	Hosted			1	None	<a href="#">Add Source</a>   <a href="#">Edit</a>   <a href="#">Delete</a>
CloudFoundry	HTTP					<a href="#">Show URL</a>   <a href="#">Edit</a>   <a href="#">Delete</a>

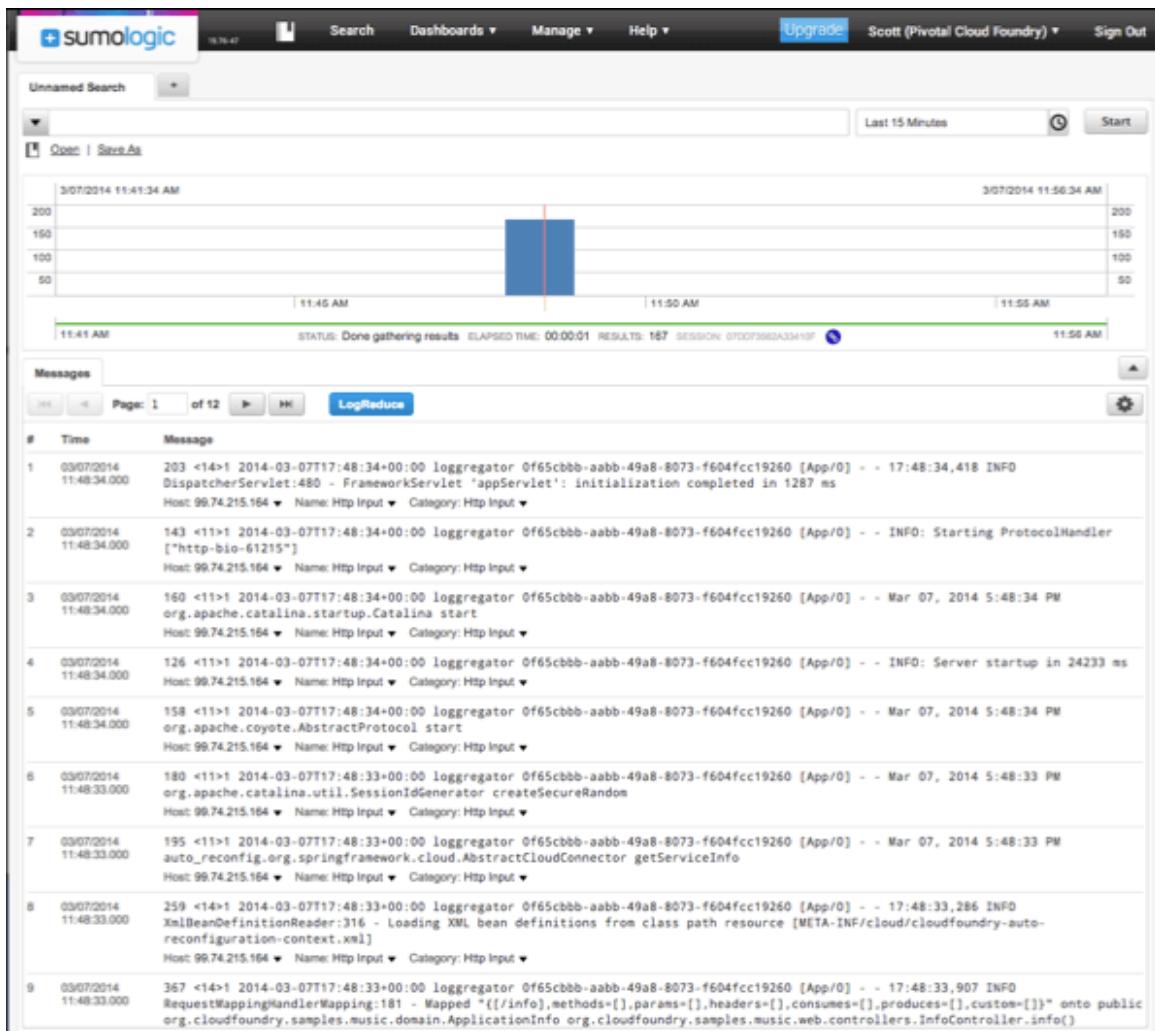
- Using the cf CLI, create the log drain service in Cloud Foundry using the source URL you just recorded. Then you bind the service to an app and restage the app using the syntax shown here. After a short delay, the logs begin to flow.

```
$ cf cups my-logs -l HTTPS-SOURCE-URL
$ cf bind-service APPLICATION-NAME my-logs
$ cf restage APPLICATION-NAME
```

- In the SumoLogic dashboard, click **Manage**, then click **Status** to see a view of the log entries.



9. Click **Search**. Place the pointer in the search box, then click **Enter** to submit an empty search query.



# Logsene

Logsene uses HTTPS for communication. HTTPS is supported in Cloud Foundry v158 and later.

In your Sematext account:

1. Click the [Create App / Logsene App](#) menu item. Enter a name and click **Add Application** to create the Logsene App.

- Using the cf CLI, create the log drain service using the source URL displayed. Then you bind the service to an app and restage the app using the syntax shown here. After a short delay, the logs begin to flow. The logs appear in the [Logsene UI](#).

```
$ cf cups logsene-log-drain -l https://logsene-cf-receiver.semantext.com/YOUR_LOGSENE_TOKEN
$ cf bind-service YOUR-CF-APP-NAME logsene-log-drain
$ cf restage APPLICATION-NAME
```

## Logentries is not supported

Using Logentries is discouraged because it does not support multiple syslog sources. Cloud Foundry distributes log entries over multiple servers to handle the load.

## Streaming app logs to Splunk

You can follow the steps here to integrate Cloud Foundry with Splunk Enterprise for logging.

### Step 1. Create a Cloud Foundry syslog drain for Splunk

In Cloud Foundry, create a syslog drain user-provided service instance as described in [Using third-party log management services](#).

Choose one or more apps whose logs you want to drain to Splunk through the service.

Bind each app to the service instance and restart the app.

Note the GUID for each app, the IP address of the Loggregator host, and the port number for the service. Locate the port number in the syslog URL. For example:

`syslog://logs.example.com:1234`

### Step 2. Prepare Splunk for Cloud Foundry

For detailed information about the following tasks, see the [Splunk documentation](#).

#### Install the RFC5424 syslog technology add-on

The Cloud Foundry Loggregator component formats logs according to the syslog protocol defined in [RFC 5424](#). Splunk does not parse log fields according to this protocol. To allow Splunk to correctly parse RFC 5424 log fields, install the Splunk [RFC5424 Syslog technical add-on](#).

#### Patch the RFC5424 syslog technology add-on

- SSH into the Splunk VM
- Replace `/opt/splunk/etc/apps/rfc5424/default/transforms.conf` with a new `transforms.conf` file that consists of the following text:

```
[rfc5424_host]
DEST_KEY = MetaData:Host
REGEX = <\d+>\d{1}\s{1}\S+\s{1}(\s+)
```

```

FORMAT = host::$1

[rfc5424_header]
REGEX = <(\d+)>\d{1}\s{1}\S+\s{1}\S+\s{1}(\S+)\s{1}(\S+)\s{1}(\S+)
FORMAT = prival::$1 appname::$2 procid::$3 msgid::$4
MV_ADD = true

```

### 3. Restart Splunk

## Create a TCP syslog data input

Create a TCP syslog data input in Splunk, with the following settings:

- **TCP port** is the port number you assigned to your log drain service
- **Set sourcetype** is `Manual`
- **Source type** is `rfc5424_syslog` (type this value into text field)
- **Index** is the index you created for your log drain service

Your Cloud Foundry syslog drain service is now integrated with Splunk.

## Step 3. Verify that the integration was successful

Use Splunk to run a query of the form:

```
sourcetype=rfc5424_syslog index==THE-INDEX-YOU-CREATED appname=APP-GUID
```

To view logs from all apps at once, you can omit the `appname` field.

Verify that results rows contain the three Cloud Foundry-specific fields:

- **appname**: The GUID for the Cloud Foundry app
- **host**: The IP address of the Loggregator host
- **procid**: The Cloud Foundry component emitting the log

If the Cloud Foundry-specific fields appear in the log search results, integration is successful.

If logs from an app are missing, ensure that:

- The app is bound to the service and was restarted after binding
- The service port number matches the TCP port number in Splunk

## Streaming app logs with Fluentd

**Fluentd** is an open source log collector that allows you to implement unified logging layers. With Fluentd, you can stream app logs to different back ends or services like Elasticsearch, HDFS and Amazon S3. This topic explains how to integrate Fluentd with Cloud Foundry apps.

## Step 1: Create a Cloud Foundry syslog drain for Fluentd

1. In Cloud Foundry, create a syslog drain user-provided service instance as described in [Using third-party log management services](#).
2. Choose one or more apps whose logs you want to drain to Fluentd through the service.
3. Bind each app to the service instance, and restart the app.
4. Note the GUID for each app, the IP address of the Loggregator host, and the port number for the service.
5. Locate the port number in the syslog URL. For example:

```
syslog://logs.example.com:5140
```

## Step 2: Set up Fluentd for Cloud Foundry

To continue, you must have an active Fluentd instance running. If you do not have an active Fluentd instance, see the [Fluentd documentation](#) for more details. If you use cf to deploy your fluentd instances, you have to use [tcp routing](#).

Fluentd comes with native support for syslog protocol. To set up Fluentd for Cloud Foundry, configure the syslog input of Fluentd as follows.

1. In your main Fluentd configuration file, add the following `source` entry:

```
<source>
  @type syslog
  port 8080
  bind 0.0.0.0
  tag cf.app
  message_length_limit 99990
  frame_type octet_count
  <transport tcp>
  </transport>
  <parse>
    message_format rfc5424
  </parse>
</source>
```

2. Restart the Fluentd service.



The Fluentd syslog input plug-in supports `tls` and `tcp` options. You must use the same transport that Cloud Foundry is using.

Fluentd starts listening for syslog message on port 8080 and tagging the messages with `cf.app`, which can be used later for data routing. For more details about the full setup for the service, see [Config File](#).

To use an Elasticsearch or Amazon S3 back end, see the [Fluentd documentation](#).

## Streaming app logs to Azure OMS Log Analytics

Here are instructions for integrating your VMware Tanzu Application Service for VMs (TAS for VMs) apps with OMS Log Analytics in the [Microsoft documentation](#).

Operations Management Suite (OMS) Log Analytics is a monitoring service for Microsoft Azure. The OMS Log Analytics Firehose Nozzle is a TAS for VMs component that forwards metrics from the Loggregator Firehose to OMS Log Analytics.

This topic assumes you are using the latest version of the Cloud Foundry Command Line Interface (cf CLI) and a working TAS for VMs deployment on Azure.

## Step 1: Create an OMS workspace in Azure

To create an OMS workspace, see the [Microsoft documentation](#) in the Microsoft Azure documentation.

## Step 2: Deploy the nozzle to TAS for VMs

To deploy the OMS Log Analytics Firehose nozzle to TAS for VMs:

1. Authenticate to your TAS for VMs instance. For more information, see [Creating and Managing Users with the UAA CLI \(UAAC\)](#) and [Orgs, spaces, roles, and permissions](#). Run:

```
cf login -a https://api.YOUR-DOMAIN -u YOUR-USERNAME --skip-ssl-validation
```

Where:

- **YOUR-DOMAIN** is your domain.
- **YOUR-USERNAME** is your TAS for VMs user name.

2. To create a new TAS for VMs user and grant it access to the Loggregator Firehose using the UAA CLI (UAAC):

1. Target your UAA server by running:

```
uaac target uaa.YOUR-DOMAIN --skip-ssl-validation
```

Where **YOUR-DOMAIN** is your domain.

2. Obtain an access token for the admin client by running:

```
uaac token client get admin
```

3. Create a new user by running:

```
uaac user add USERNAME -p PASSWORD --email EMAIL
```

Where:

- **USERNAME** is a new user name.
- **PASSWORD** is a password.
- **EMAIL** is an email address.

4. Grant the new user admin permissions by running:

```
uaac member add cloud_controller.admin USERNAME
```

Where `USERNAME` is the user name you set in an earlier step.

- Grant the new user permission to read logs from the Loggregator Firehose endpoint by running:

```
uaac member add doppler.firehose USERNAME
```

Where `USERNAME` is the user name you set.

- Download the [OMS Log Analytics Firehose Nozzle BOSH release](#) from GitHub. Clone the repository and navigate to the `oms-log-analytics-firehose-nozzle` directory by running:

```
git clone https://github.com/Azure/oms-log-analytics-firehose-nozzle.git
cd oms-log-analytics-firehose-nozzle
```

- Set the environment variables in the [OMS Log Analytics Firehose Nozzle manifest](#):

Environment variable	Description
<pre>applications:   - name: oms_nozzle   ... env:   OMS_WORKSPACE: YOU   R-WORKSPACE-ID   OMS_KEY: YOUR-OMS-   KEY</pre>	Enter the ID and key value for your OMS workspace.
<code>OMS_POST_TIMEOUT: 10s</code>	(Optional) Set the HTTP post timeout for sending events to OMS LogAnalytics. The default value is 10 seconds.
<code>OMS_BATCH_TIME: 10s</code>	(Optional) Set the interval for posting a batch to OMS. The default value is 10 seconds.  For more information, see <a href="#">Configure Additional Logging</a> .
<code>OMS_MAX_MSG_NUM_PER_BATCH: 1000</code>	(Optional) Set the maximum number of messages to include in an OMS batch. The default amount is 1000.  For more information, see <a href="#">Configure Additional Logging</a> .
<pre>FIREHOSE_USER: YOUR- FIREHOSE-USER FIREHOSE_USER_PASSWORD: YOUR-FIREHOSE-PASS WORD</pre>	Enter the user name and password for the Firehose user you created in Step 2c.
<code>API_ADDR: https://api.YOUR-DOMAIN</code>	Enter the URL of your API endpoint.

Environment variable	Description
DOPPLER_ADDR: wss://doppler.YOUR-DOMAIN:443	Enter the URL of your Loggregator Traffic Controller endpoint.
EVENT_FILTER: YOUR-LIST	(Optional) Enter the event types you want to filter out in a comma-separated list. The valid event types are METRIC, LOG, and HTTP.
IDLE_TIMEOUT: 60s	(Optional) Set the duration for the Firehose keep-alive connection. The default time is 60 seconds.
SKIP_SSL_VALIDATION: TRUE-OR-FALSE	Set this value to TRUE to allow insecure connections to the UAA and the Traffic Controller. To block insecure connections to the UAA and Traffic Controller, set this value to FALSE.
LOG_LEVEL: INFO	(Optional) Change this value to increase or decrease the amount of logs. Valid log levels in increasing order include INFO, ERROR, and DEBUG. The default value is INFO.
LOG_EVENT_COUNT: TRUE-OR-FALSE	Set this value to TRUE to log the total count of events that the nozzle has sent, received, and lost. OMS logs this value as CounterEvents.
	For more information, see <a href="#">Configure Additional Logging</a> .
LOG_EVENT_COUNT_INTERVAL: 60s	(Optional) Set the time interval for logging the event count to OMS. The default interval is 60 seconds.
	For more information, see <a href="#">Configure Additional Logging</a> .

5. Push the app by running:

```
cf push
```

## Step 3: View logs in OMS Portal

Import the TAS for VMs OMS view to your OMS Portal to view visualized logs and metrics. You can also create alert rules for specific events.

The OMS view of TAS for VMs is not available in the OMS Solutions Gallery. You can add it manually to view your logs in OMS Portal.

### Import the OMS view

To import the OMS view:

- From the main OMS Overview page, go to **View Designer**.
- Click **Import**.
- Click **Browse**.
- Select the **Cloud Foundry (Preview).omsview** file.
- Save the view. The main OMS Overview page displays the **Tile**.
- Click the **Tile** to view visualized metrics.

For more information, see the [Microsoft documentation](#) in the Azure documentation.

## Create alert rules

For more information about OMS Log Analytics alerts, see the [Microsoft documentation](#) in the Azure documentation.

## Set alert queries

This section includes example queries that operators can set in the OMS Portal.

- This query alerts the operator when the nozzle sends a `slowConsumerAlert` to OMS:

```
Type=CF_ValueMetric_CL Name_s=slowConsumerAlert
```

- This query alerts the operator when Loggregator sends an `LGR` to indicate problems with logging:

```
Type=CF_LogMessage_CL SourceType_s=LGR MessageType_s=ERR
```

- This query alerts the operator when the number of lost events reaches a certain threshold, specified in the OMS Portal:

```
Type=CF_CounterEvent_CL Job_s=nozzle Name_s=eventsLost
```

- This query alerts the operator when the nozzle receives the `TruncatingBuffer.DroppedMessages CounterEvent`:

```
Type=CF_CounterEvent_CL Name_s="TruncatingBuffer.DroppedMessages"
```

## Step 4: Configure additional logging (optional)

OMS Log Analytics Firehose Nozzle forwards metrics from the Loggregator Firehose to OMS with minimal processing, but the nozzle can push additional metrics to OMS.

### Logs sent and received, events lost

If you set the `LOG_EVENT_COUNT` environment variable to `TRUE` in the [manifest](#), the nozzle periodically sends the count of sent, received, and lost events to OMS. The value you set for the `LOG_EVENT_COUNT_INTERVAL` specifies how frequently the nozzle sends the count.

The nozzle does not count CounterEvents in the sent, received, or lost event count.

The nozzle sends the count as a **CounterEvent** with one of these values for **CounterKey**:

CounterEvent	CounterKey
nozzle.stats.eventsReceived	The number of events the Firehose has received during the interval
nozzle.stats.eventsSent	The number of events the nozzle has sent to OMS during the interval
nozzle.stats.eventsLost	The number of events the nozzle has tried to send to OMS during the interval, but failed to send after 4 attempts

In most cases, the total count of `eventsSent` plus `eventsLost` is less than the total `eventsReceived` at the same time. The nozzle buffers some messages and posts them in a batch to OMS. Operators can

adjust the buffer size by adjusting the `OMS_BATCH_TIME` and `OMS_MAX_MSG_NUM_PER_BATCH` environment variables in the manifest.

## Log slow consumer alerts

Loggregator sends the nozzle a `slowConsumerAlert` when:

- WebSocket sends the error code `ClosePolicyViolation (1008)`.
- The nozzle receives a **CounterEvent** with the value `TruncatingBuffer.DroppedMessages`.

In either case, the nozzle sends the `slowConsumerAlert` event to OMS as the following **ValueMetric**:

ValueMetric	MetricKey
nozzle.alert.slowConsumerAlert	1

The nozzle does not count ValueMetrics in the sent, received, or lost event count.

For more information, see the [Slow Nozzle Alerts](#) section of the *Loggregator Guide for TAS for VMs Operators* topic.

## Step 5: Scale the deployment (optional)

### Scale the nozzle

If the nozzle is unable to keep up with processing logs from the Firehose, Loggregator alerts the nozzle. When the nozzle receives the alert, it sends a `slowConsumerAlert` to OMS. If this happens, scaling up the nozzle minimizes data loss.

If an operator scales up their deployment, the Firehose evenly distributes events across all instances of the nozzle. For more information, see the [Scaling Nozzles](#) section of the *Loggregator Guide for TAS for VMs Operators* topic.

Operators can create an alert rule for the `slowConsumerAlert` message. For more information, see [Create alert rules](#).

### Scale Loggregator

Loggregator sends `LGR` log entries to indicate problems with logging. For more information, see [Scaling Loggregator](#) in *Loggregator Guide for TAS for VMs Operators*.

Operators can create an alert rule for the `LGR` message. For more information, see [Create alert rules](#).

## Using metrics with drain logs

Here are instructions for using metrics to filter and report draining logs from Cloud Foundry. It also describes how to detect and diagnose system problems based on dropped metrics.

## How app logs are collected

The Diego Runtime reads the apps `stdout` and `stderr`, packs the logs into a common format, and sends the data to the forwarder agents. The forwarder agents aggregate the various ways of reading the logs and

metrics on the VM. The forwarder agent then forwards the data to the Syslog agent and the Loggregator agent. The Syslog agent gathers all app logs, container metrics, and platform component metrics and forwards them to various syslog drains, based on the configuration. For more info, see [loggregator-agents-release](#) on GitHub.

## Ingress and egress metrics

There are two ingress metrics with different values for the `drain_scope` tag:

- `agent` - shows the overall number of log envelopes ingested by the syslog agent
- `all_drains` - shows the overall number of log envelopes written to the separate drain buffers

There are two layers of buffering of the ingested messages:

- The first layer is a single buffer connected to the forwarder agent. This doesn't involve filtering. The buffer receives everything. This buffer also has an `ingress_dropped` metric, which is incremented when a message cannot be ingested.
- The second layer is made up of multiple buffers, one per syslog drain. The EnvelopeWriter reads messages from the first layer buffer, matches the source ID (app GUID or platform component name), selects the proper drain buffer, and writes the log envelope to it. There is no ingress metric here. The messages from these buffers are read, and based on the syslog scheme configuration, they are forwarded to the external Syslog servers.

The egress metric shows the number of logs forwarded with the syslog drain. The `dropped_logs` metric shows the number of failures and where the messages were dropped. Drops can happen when, for example, the Syslog server is overloaded and cannot process any more messages. The addition of the `drain_scope` and `drain_url` tags allows you to quickly see if there are some log drops in a particular drain and what kind of drain that is. If it's an `app` drain, it means that the third-party logging system cannot consume the messages. For `aggregate` drains, it is important that they work properly. Otherwise, you might collect platform metrics and send them to your platform monitoring, and if the platform monitoring doesn't work properly, you don't have a good overview of what's happening in the system.

## Checking for dropped metrics

Egress drops could mean that you are getting the wrong picture of the current state of the system, and you might not take appropriate or adequate action when something is wrong. You are generally not very concerned if an application syslog drain has egress drops, but if the metrics in the platform monitoring are missing, that will definitely be an indication you need to take some remedial action.

If there are many ingress drops on particular VM and you see higher egress rates on an application's drains, it might mean that some application has problems and has started to log too much, or if this happens on multiple applications, you might need to scale the Diego Cells. You can use aggregate metrics based on the `drain_scope` value to generate to check the usage and generate alerts, if needed.

There are also syslog drain egress dropped metrics. The metric that gives you the drops per drain is `messages_dropped_per_drain`. Using the `drain_url` and setting the direction to `egress`, you can filter by drain to see if there are drops. If you use the same `drain_url` for apps and aggregate drains, you can filter on the `drain_scope` tag as well. These metrics are available "out of the box."

Alternatively, you can correlate ingress and egress messages based on the source ID (app GUID). For example, you might have egress drops on a drain with a given `drain_url`. You can read the egress dropped metric based on the value of the `drain_url` tag and get the value of the `SourceId` tag. With the `SourceId` tag, you can check the ingress for that `SourceId`. If you want to inspect it even more deeply and you have applications with multiple instances, you can analyze the `InstanceId` tag to get the app instance GUID. With this information, you can use cf API calls to get the `org`, `space`, and `org users`, for example, and take some action, like contacting the app owners or developers.

Using the `drain_scope` and `drain_url` to get information about dropped metrics:

- `drain_scope` - The aggregate drains are special drains that send everything to the specified URL, which is generally the logging and monitoring system for the whole platform (Loggregator gathers and forwards app logs, app container metrics, and platform component metrics), so it is important to see that everything is forwarded and there are no drops.
- `drain_url` - If you see problems, higher loads, or more drops on a particular syslog drain, you can identify the problem app based on the `drain_url`. Syslog drain egress drops mean that the syslog server is not properly scaled to handle the required number of messages. You can set it up so that an alert is triggered to inform the app owners (customers) to check their systems. This helps you avoid outage tickets.

Generally speaking, adding these tags allows you to get a fine-grained overview of what's happening with the syslog drains, and then proactively take actions to avoid outages in your foundations. You can also keep your customers informed about the state of their syslog drains, and possibly overloaded servers.

## Example queries (using Grafana and InfluxDB)

Here are some example queries using Grafana and InfluxDB for monitoring.

- Aggregate drain egress drops per second on Diego-Cells:

```
SELECT non_negative_derivative(mean("messages_dropped_per_drain"), 1s) FROM
"CF.syslog_agent" WHERE $timeFilter AND "drain_scope" = 'aggregate' AND "instance"
= 'diego-cell' GROUP BY time($__interval), "deployment", "instance",
"instance_id", "drain_url" fill(null)
```

- App drain egress per second on Diego-Cells:

```
SELECT non_negative_derivative(mean("egress"), 1s) FROM "CF.syslog_agent" WHERE
$timeFilter AND "instance" = 'diego-cell' AND "drain_scope" = 'app' GROUP BY
time($__interval), "instance", "instance_id", "drain_url" fill(null)
```

- For syslog agent ingress metrics on Diego-Cells:

```
SELECT non_negative_derivative(mean("ingress"), 1s) FROM "CF.syslog_agent" WHERE
$timeFilter AND "scope" = 'agent' AND "instance" = 'diego-cell' GROUP BY
time($__interval), "instance", "instance_id" fill(null)
```

Because the transfer from the first level buffer to the second level syslog drain buffers happens in the same app, the syslog agent, the metric should have the same values despite the value set for the scope “agent” or “all\_drains.” These examples use “agent” for consistency because, for agent, there is an ingress metric, and an ingress dropped metric.

## SSH for apps and services

In this section:

- [Configuring SSH access for your deployment](#)
- [Accessing your apps with SSH](#)
- [Accessing services with SSH](#)

## Configuring SSH access for your deployment

If you need to troubleshoot an instance of an application, you can gain SSH access to the app using the SSH proxy and daemon. For example, one of the app instances might be unresponsive, or the log output from the app is inconsistent or incomplete. You can SSH into the individual VM to troubleshoot the problem instance.

## About SSH access

The SSH system components include the SSH proxy and daemon, and the system also supports authentication and load balancing of incoming SSH traffic. For a conceptual overview, see [App SSH components and processes](#).

## SSH access control hierarchy

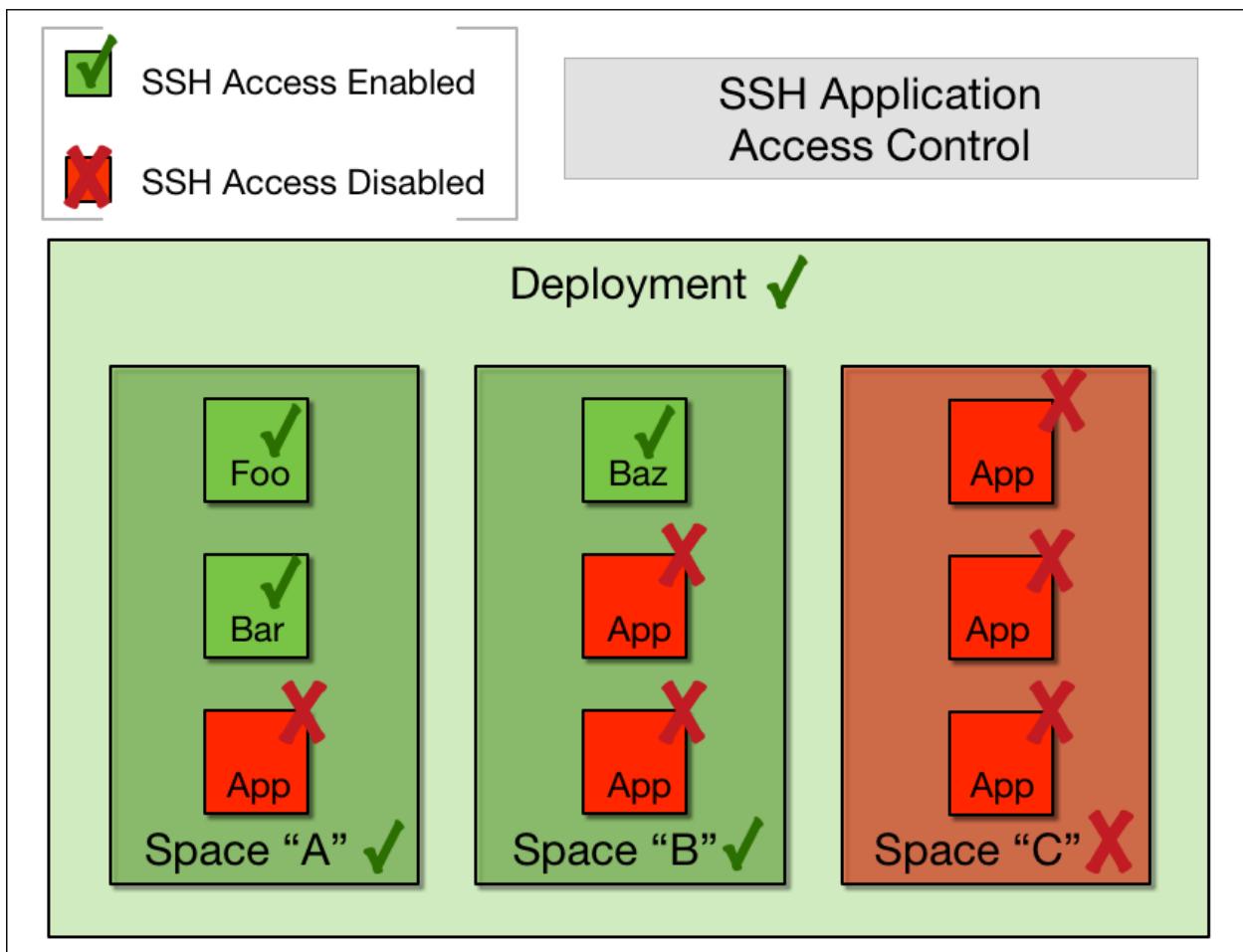
Operators, space managers, and space developers can configure SSH access for TAS for VMs, for spaces, and for apps as described in the table:

User role	Scope of SSH permissions control	How they define SSH permissions
Operator	Entire deployment	Configure the deployment to allow or prohibit SSH access (one-time). For more information, see <a href="#">Configuring SSH Access for TAS for VMs</a> .
Space manager	Space	cf CLI <code>cf allow-space-ssh</code> and <code>cf disallow-space-ssh</code> commands
Space developer	App	cf CLI <code>enable-ssh</code> and <code>disable-ssh</code> commands

An app is SSH-accessible only if operators, space managers, and space developers all grant SSH access at their respective levels. For example, the following image shows a deployment in whi:

- An operator allowed SSH access at the deployment level.
- A space manager allowed SSH access for apps running in spaces “A” and “B,” but not “C”.
- A space developer activated SSH access for apps that include “Foo”, “Bar,” and “Baz”.

As a result, apps “Foo”, “Bar,” and “Baz” accept SSH requests.



Space A has SSH Access Enabled, indicated by a green check mark, for apps “Foo” and “Bar,” Space A does not have SSH Access allowed for the third app, indicated by a red X.

Space B has has SSH Access Enabled, indicated by a green check mark, for app “Baz”. Space B does not have SSH Access allowed for the other two apps, indicated by a red X.

Space C does not have SSH Access allowed for all three apps, indicated by a red X.

## SSH access for apps and spaces

Space managers and space developers can configure SSH access from the CLI. The Cloud Foundry Command Line Interface (cf CLI) also includes commands to return the value of the SSH access setting. To use and configure SSH at both the app level and the space level, see [Accessing apps with Diego SSH](#).

## Configuring SSH access for VMware Tanzu Application Service for VMs

Tanzu Operations Manager deployments control SSH access to apps at the TAS for VMs level. Additionally, TAS for VMs supports load balancing of SSH sessions with your load balancer. For information about setting SSH access for your deployment, see [Configuring SSH Access](#).

## Accessing your apps with SSH

The Cloud Foundry Command Line Interface (cf CLI) lets you securely log in to remote host virtual machines (VMs) running VMware Tanzu Application Service for VMs (TAS for VMs) app instances. The commands that activate SSH access to apps, and activate, deactivate, and verify permissions for such access are described here.



The `cf ssh` command in cf CLI v7+ includes the `all_proxy` environment variable, which allows you to specify a proxy server to activate proxying for all requests. For more information, see [Use SOCKS5 with cf v3-ssh](#) in *Using the cf CLI with a proxy server*. For command details, enter `cf ssh --help`

The cf CLI looks up the `app_ssh_oauth_client` identifier in the Cloud Controller `/v2/info` endpoint, and uses this identifier to query the UAA server for an SSH authorization code. On the target VM side, the SSH proxy contacts the Cloud Controller through the `app_ssh_endpoint` listed in `/v2/info` to confirm permission for SSH access.

## App SSH commands

cf CLI command	Purpose
<code>cf enable-ssh</code> <code>cf disable-ssh</code> <code>cf allow-space-ssh</code> <code>cf disallow-space-ssh</code>	Activate and deactivate SSH access
<code>cf ssh-enabled</code> <code>cf space-ssh-allowed</code>	Verify SSH access permissions
<code>cf ssh</code>	Log in to an application container with cf SSH
<code>cf ssh-code</code>	App SSH access without cf CLI using non-cf SSH tools like <code>ssh</code> , <code>scp</code> , and <code>sftp</code>

## Activate and deactivate SSH access

A cloud operator can deploy TAS for VMs to either allow or prohibit app SSH across the entire deployment. For more information, see [Configuring SSH Access for TAS for VMs](#).

Within a deployment that permits SSH access to apps, Space Developers can activate or deactivate SSH access to individual apps, and Space Managers can activate or deactivate SSH access to all apps running within a space.

You must restart your app after enabling SSH access.

### Configuring SSH access at the app level

`cf enable-ssh` activates SSH access to all instances of an app:

```
$ cf enable-ssh MY-AWESOME-APP
```

`cf disable-ssh` deactivates SSH access to all instances of an app:

```
$ cf disable-ssh MY-AWESOME-APP
```

## Configuring SSH access at the space level

`cf allow-space-ssh` allows SSH access into all apps in a space:

```
$ cf allow-space-ssh SPACE-NAME
```

`cf disallow-space-ssh` disallows SSH access into all apps in a space:

```
$ cf disallow-space-ssh SPACE-NAME
```

## Verify SSH permissions

`cf ssh-enabled` verifies whether an app is accessible with SSH:

```
$ cf ssh-enabled MY-AWESOME-APP
ssh support is disabled for 'MY-AWESOME-APP'
```

`cf space-ssh-allowed` verifies whether all apps running within a space are accessible with SSH:

```
$ cf space-ssh-allowed SPACE-NAME
ssh support is enabled in space 'SPACE-NAME'
```

## Log in to an application container with cf SSH

If SSH access is allowed at the deployment, space, and app level, you can run the `cf ssh APP-NAME` command to start an interactive SSH session with a VM hosting an app. By default, the command accesses the container running the first instance of the app, the instance with index **0**.

```
$ cf ssh MY-AWESOME-APP
```

When logged into a VM hosting an app, you can use tools like the Cloud Foundry Diego Operator Toolkit (CFDOT) to run app status diagnostics. For more information, see [How to use Cloud Foundry Diego Operator Toolkit \(CFDOT\)](#) in the Knowledge Base.

## Common cf SSH flags

You can tailor `cf ssh` commands with the following flags, most of which mimic flags for the UNIX or Linux `ssh` command. Run the `cf ssh --help` command for more details.

- The `-i` flag targets a specific instance of an app. To log in to the VM container hosting the third instance, `index=2`, of MY-AWESOME-APP, run:

```
$ cf ssh MY-AWESOME-APP -i 2
```

- The `-L` flag activates local port forwarding, binding an output port on your machine to an input port on the app VM. Pass in a local port, and your app VM port and port number, all colon-separated. You can prepend your local network interface, or use the default `localhost`.

```
$ cf ssh MY-AWESOME-APP -L [LOCAL-NETWORK-INTERFACE:]LOCAL-PORT:REMOTE-
```

HOST-NAME:REMOTE-HOST-PORT

- The `-N` flag skips returning a command prompt on the remote machine. This sets up local port forwarding if you do not need to run commands on the host VM.
- The `--process` flag in cf CLI v7+ allows you to SSH into the container for a specific process running as part of your app.
- The `--request-pseudo-tty` and `--force-pseudo-tty` flags allow you run an SSH session in pseudo-tty mode rather than generate terminal line output.

## SSH session environment

To make the environment of your interactive SSH session match the environment of your buildpack-based app, with the same environment variables and working directory, run the following command after starting the session:

```
/tmp/lifecycle/shell
```

After running the previous command, the value of the `VCAP_APPLICATION` environment variable differs slightly from its value in the environment of the app process, because it does not have the `host`, `instance_id`, `instance_index`, or `port` fields set. These fields are available in other environment variables, as described in [VCAP\\_APPLICATION](#) in *TAS for VMs Environment Variables*.

## App SSH access without cf CLI

In addition to `cf ssh`, you can use other SSH clients such as `ssh`, `scp`, or `sftp` to access your app, if you have SSH permissions.

Follow one of these procedures to securely connect to an app instance by logging in with a specially-formed user name that passes information to the SSH proxy running on the host VM. For the password, use a one-time SSH authorization code generated by `cf ssh-code`.

- [Access app SSH using process GUID](#)
- [Access app sSH using app GUID](#)

### Access app SSH using process GUID

1. Query the `/v2/info` endpoint of the Cloud Controller in your deployment. Record the domain name and port number of the `app_ssh_endpoint` field, and the `app_ssh_host_key_fingerprint` field. You can compare the `app_ssh_host_key_fingerprint` with the fingerprint returned by the SSH proxy on your target VM. For example:

```
$ cf curl /v2/info
{
  ...
  "app_ssh_endpoint": "ssh.example.com:2222",
  "app_ssh_host_key_fingerprint": "a6:14:c0:ea:42:07:b2:f7:53:2c:0b:
60:e0:00:21:6c",
```

```
...  
}
```

In this example:

- The domain name is `ssh.example.com`.
- The port number is `2222`.
- The fingerprint is `a6:14:c0:ea:42:07:b2:f7:53:2c:0b:60:e0:00:21:6c`.

## 2. Run:

```
ssh -p PORT-NUMBER cf:$(cf curl /v3/apps/$(cf app APP-NAME --guid)/processes | jq -r '.resources[] | select(.type=="web") | .guid')/0@SSH-ENDPOINT
```

Where:

- `PORT-NUMBER` is the port number of the `app_ssh_endpoint` field that you recorded in an earlier step.
- `APP-NAME` is the name of your target app.
- `SSH-ENDPOINT` is the domain name of the `app_ssh_endpoint` field that you recorded in an earlier step.

For example:

```
ssh -p 2222 cf:$(cf curl /v3/apps/$(cf app my-app --guid)/processes | jq -r '.resources[] | select(.type=="web") | .guid')/0@ssh.example.com
```

## 3. Run `cf ssh-code` to obtain a one-time authorization code that substitutes for an SSH password.

You can run `cf ssh-code | pbcopy` to copy the code to the clipboard. For example:

```
$ cf ssh-code  
E1x89n
```

## 4. When the SSH proxy reports its RSA fingerprint, confirm that it matches the `app_ssh_host_key_fingerprint` recorded previously. When prompted for a password, paste in the authorization code returned by `cf ssh-code`. For example:

```
$ ssh -p 2222 cf:abcdefab-1234-5678-abcd-1234abcd1234/0@ssh.MY-DOMAIN.com  
The authenticity of host '[ssh.example.com]:2222 ([203.0.113.5]:2222)' can't be established.  
RSA key fingerprint is a6:14:c0:ea:42:07:b2:f7:53:2c:0b:60:e0:00:21:6c.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '[ssh.example.com]:2222 [203.0.113.5]:2222' (RSA) to the list of known hosts.  
cf:d0a2e11d-e6ca-4120-b32d-140@ssh.ketchup.cf-app.com's password:  
vcap@ce4l5164kws:~$
```

You have now securely connected to the app instance.

## Access app SSH using app GUID

1. Display the GUID of your target app by running:

```
cf app APP-NAME --guid`
```

Where `APP-NAME` is the name of the app.

For example:

```
$ cf app my-app --guid
abcdefab-1234-5678-abcd-1234abcd1234
```

2. Query the `/v2/info` endpoint of the Cloud Controller in your deployment. Record the domain name and port number of the `app_ssh_endpoint` field, and the `app_ssh_host_key_fingerprint` field. You can compare the `app_ssh_host_key_fingerprint` with the fingerprint returned by the SSH proxy on your target VM. For example:

```
$ cf curl /v2/info
{
  ...
  "app_ssh_endpoint": "ssh.example.com:2222",
  "app_ssh_host_key_fingerprint": "a6:14:c0:ea:42:07:b2:f7:53:2c:0b:
60:e0:00:21:6c",
  ...
}
```

In this example:

- The domain name is `ssh.example.com`.
  - The port number is `2222`.
  - The fingerprint is `a6:14:c0:ea:42:07:b2:f7:53:2c:0b:60:e0:00:21:6c`.
3. Run `cf ssh-code` to obtain a one-time authorization code that substitutes for an SSH password. You can run `cf ssh-code | pbcopy` to copy the code to the clipboard. For example:

```
$ cf ssh-code
E1x89n
```

4. Run your `ssh` or other command to connect to the app instance.

- SSH into the container hosting the first instance of your app by running:

```
ssh -p `SSH-PORT` cf:APP-GUID/APP-INSTANCE-INDEX@SSH-ENDPOINT
```

Where:

- `SSH-PORT` is the port number recorded in earlier steps.
- `APP-GUID` comes from earlier steps.
- `APP-INSTANCE-INDEX` is the index of the instance that you want to access.

- `SSH-ENDPOINT` comes from the earlier steps and is in the form `ssh.MY-DOMAIN.com`.

For example:

```
$ ssh -p 2222 cf:abcdefab-1234-5678-abcd-1234abcd1234/0@ssh.example.com
```

- Or you can use `scp` to transfer files by running one of the following commands:

```
scp -P `SSH-PORT` -o User=cf:APP-GUID/APP-INSTANCE-INDEX ssh.MY-DOMAIN.com:REMOTE-FILE-TO-RETRIEVE LOCAL-FILE-DESTINATION
```

```
scp -P `SSH-PORT` -o User=cf:APP-GUID/APP-INSTANCE-INDEX LOCAL-FILE-TO-COPY ssh.MY-DOMAIN.com:REMOTE-FILE-DESTINATION
```

- Or you can use `ssh` piped with `cat` to transfer the file:

```
cat local_file_path | cf ssh MY-AWESOME-APP -c "cat > remote_file_path"
```

- When the SSH proxy reports its RSA fingerprint, confirm that it matches the `app_ssh_host_key_fingerprint` recorded previously. When prompted for a password, paste in the authorization code returned by `cf ssh-code`, for example:

```
$ ssh -p 2222 cf:abcdefab-1234-5678-abcd-1234abcd1234/0@ssh.MY-DOMAIN.com
The authenticity of host '[ssh.MY-DOMAIN.com]:2222 ([203.0.113.5]:2222)' can't be established.
RSA key fingerprint is a6:14:c0:ea:42:07:b2:f7:53:2c:0b:60:e0:00:21:6c.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '[ssh.MY-DOMAIN.com]:2222 [203.0.113.5]:2222' (RSA) to the list of known hosts.
cf:d0a2e11d-e6ca-4120-b32d-140@ssh.ketchup.cf-app.com's password:
vcap@ce4l5164kws:~$
```

You have now securely connected to the app instance.

## SSH proxy security configuration

The SSH proxy has these SSH security configuration by default:

Security parameter	Values
Ciphers	<code>chacha20-poly1305@openssh.com</code> <code>aes128-gcm@openssh.com</code> <code>aes256-ctr</code> <code>aes192-ctr</code> <code>aes128-ctr</code>
MACs	<code>hmac-sha2-256-etm@openssh.com</code> <code>hmac-sha2-256</code>
Key exchanges	<code>curve25519-sha256@libssh.org</code>

The `cf ssh` command is compatible with this security configuration. If you use a different SSH client to access apps over SSH, you can ensure that you configure your client to be compatible with these ciphers, MACs, and key exchanges. For more information about other SSH clients, see [App SSH access without cf CLI](#).

## Proxy to container authentication

A second layer of SSH security runs within each container. When the SSH proxy attempts to handshake with the SSH daemon inside the target container, it uses the following fields associated with the `diego-ssh` key in its route to the app instance. This inner layer works invisibly and requires no user action, but is described here to complete the SSH security picture.

### **CONTAINER\_PORT (required)**

`container_port` indicates which port inside the container the SSH daemon is listening on. The proxy attempts to connect to host side mapping of this port after authenticating the client.

### **HOST\_FINGERPRINT (optional)**

When present, `host_fingerprint` declares the expected fingerprint of the SSH daemon's host public key. When the fingerprint of the actual target's host key does not match the expected fingerprint, the connection is stopped. The fingerprint must only contain the hex string generated by `ssh-keygen -l`.

### **USER (optional)**

`user` declares the user ID to use during authentication with the container's SSH daemon. While this is not a required part of the routing data, it is required for password authentication and might be required for public key authentication.

### **PASSWORD (optional)**

`password` declares the password to use during password authentication with the container's SSH daemon.

### **PRIVATE\_KEY (optional)**

`private_key` declares the private key to use when authenticating with the container's SSH daemon. If present, the key must be a PEM encoded RSA or DSA public key.

#### Example app process

```
{
  "process_guid": "ssh-process-guid",
  "domain": "ssh-experiments",
  "rootfs": "preloaded:cflinuxfs3",
  "instances": 1,
  "start_timeout": 30,
  "setup": {
    "download": {
      "artifact": "diego-sshd",
      "from": "http://file-server.service.cf.internal.example.com:8080/v1/static/diego-sshd/diego-sshd.tgz",
    }
  }
}
```

```

        "to": "/tmp",
        "cache_key": "diego-sshd"
    },
},
"action": {
    "run": {
        "path": "/tmp/diego-sshd",
        "args": [
            "-address=0.0.0.0:2222",
            "-authorizedKey=ssh-rsa ..."
        ],
        "env": [],
        "resource_limits": {}
    }
},
"ports": [ 2222 ],
"routes": {
    "diego-ssh": {
        "container_port": 2222,
        "private_key": "PEM encoded PKCS#1 private key"
    }
}
}
}

```



To avoid security exposure, migrate your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

## Daemon discovery

To be accessible through the SSH proxy, containers must host an SSH daemon, expose it through a mapped port, and advertise the port in a `diego-ssh` route. If a proxy cannot find the target process or a route, user authentication fails.

```

"routes": {
    "diego-ssh": { "container_port": 2222 }
}

```

The Diego system generates the appropriate process definitions for TAS for VMs apps to reflect the policies in effect.

## Accessing Services with SSH

You can gain direct command line access to your deployed service instance using SSH. This allows you to, for example, access your database to run raw SQL commands to edit the schema, import and export data, or debug app data issues.

To establish direct command line access to a service, you deploy a host app and use its SSH and port forwarding features to communicate with the service instance through the application container. The technique described here works with TCP services such as MySQL or Redis.

This topic requires Cloud Foundry Command Line Interface (`cf` CLI) v6.15.0 or later, but at least v7 is recommended.



The procedure in this topic requires use of a service key, and not all services support service keys. Some services support credentials through [app binding](#) only.

## Create a service instance

1. In your terminal window, log in to your deployment with `cf login`.
2. List the marketplace services installed as product tiles in your Tanzu Operations Manager deployment. If you need to add the service as a tile, see [Adding and Deleting Products](#). In this example, you create a p-mysql service instance.

```
$ cf marketplace
p-mysql 100mb MySQL databases on demand
```

3. Create your service instance. As part of the `cf create-service` command, indicate the service name, the service plan, and the name you choose for your service instance.

```
$ cf create-service p-mysql 100mb MY-DB
```

## Push your host app

To push an app that acts as the host for the SSH tunnel, push any app that is deployed to VMware Tanzu Application Service for VMs. Your app must be prepared before you push it. See [Pushing an app](#) for details about preparing apps for pushing.

1. Push your app:

```
cf push YOUR-HOST-APP
```

2. Activate SSH for your app:

```
cf enable-ssh YOUR-HOST-APP
```

To activate SSH access to your app, SSH access must also be activated for both the space that contains the app and VMware Tanzu Application Service for VMs. For more information, see [App SSH Overview](#).

## Create your service key

To establish SSH access to your service instance, you must create a service key that contains critical information for configuring your SSH tunnel.

1. Create a service key for your service instance using the `cf create-service-key` command.

```
cf create-service-key MY-DB EXTERNAL-ACCESS-KEY
```

2. Retrieve your new service key using the `cf service-key` command.

```
cf service-key MY-DB EXTERNAL-ACCESS-KEY
```

For example:

```
$ cf service-key MY-DB EXTERNAL-ACCESS-KEY
Getting key EXTERNAL-ACCESS-KEY for service instance MY-DB as user@example.com

{
  "hostname": "us-cdbr-iron-east-01.p-mysql.net",
  "jdbcUrl": "jdbc:mysql://us-cdbr-iron-east-03.p-mysql.net/ad\_b2fca6t49704585d?user=b5136e448be920\u0026password=231f435o05",
  "name": "ad\_b2fca6t49704585d",
  "password": "231f435o05",
  "port": "3306",
  "uri": "mysql://b5136e448be920:231f435o05@us-cdbr-iron-east-03.p-mysql.net:3306/ad\_b2fca6t49704585d?reconnect=true",
  "username": "b5136e448be920"
}
```

## Configure your SSH tunnel

Configure an SSH tunnel to your service instance using the `cf ssh` command. Tailor the following example command with information from your service key.

```
$ cf ssh -L 63306:us-cdbr-iron-east-01.p-mysql.net:3306 YOUR-HOST-APP
```

- You can use any available local port for port forwarding; for example, `63306`.
- `us-cdbr-iron-east-01.p-mysql.net` is the address provided under `hostname` in the service key retrieved earlier.
- `3306` is the port provided under `port`.
- `YOUR-HOST-APP` is the name of your host app.

After you enter the command, open another terminal and follow the steps in [Access your service instance](#).

## Access your service instance

To establish direct command line access to your service instance, use the relevant command line tool for that service. This example uses the MySQL command line client to access the p-mysql service instance.

```
$ mysql -u b5136e448be920 -h 0 -p -D ad_b2fca6t49704585d -P 63306
```

- Replace `b5136e448be920` with the user name provided under `username` in your service key.
- `-h 0` instructs `mysql` to connect to your local machine (use `-h 127.0.0.1` for Windows).
- `-p` instructs `mysql` to prompt for a password. When prompted, use the password provided under `password` in your service key.

- Replace `ad_b2fca6t49704585d` with the database name provided under `name` in your service key.
- `-P 63306` instructs `mysql` to connect on port 63306.

## Cloud Foundry Buildpacks

In this section:

- CF Buildpack Languages and Sources
- **Classic Buildpacks**
  - Using Classic Buildpacks in Cloud Foundry
- Binary buildpack
- Go buildpack
- **Hosted Web Core buildpack (.NET Framework)**
  - Hosted Web Core buildpack
  - Creating an extension buildpack for .NET apps
  - Developing and pushing .NET Framework apps
- **Java buildpack**
  - Java buildpack
  - Using Cloud Foundry Java buildpack
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  - Using Java Native Image buildpack
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  - Node.js buildpack
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- Python buildpack
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  - Ruby buildpack
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  - Windows Gemfile support
- Staticfile buildpack

## CF Buildpack Languages and Sources

This topic tells you about the existing system buildpacks that Cloud Foundry supports.

Cloud Foundry includes a set of system buildpacks for common languages and frameworks.

The following table lists the system buildpacks:

Name	Supported Languages, Frameworks, and Technologies	GitHub Repository
Binary	n/a	<a href="#">Binary source</a>
Go	Go	<a href="#">Go source</a>
HWC	HWC	<a href="#">HWC source</a>
Java	Grails, Play, Spring, or any other JVM-based language or framework	<a href="#">Java source</a>
.NET Core	.NET Core	<a href="#">.NET Core source</a>
NGINX	NGINX	<a href="#">NGINX source</a>
Node.js	Node or JavaScript	<a href="#">Node.js source</a>
PHP	Cake, Symfony, Zend, NGINX, or HTTPD	<a href="#">PHP source</a>
Python	Django or Flask	<a href="#">Python source</a>

Name	Supported Languages, Frameworks, and Technologies	GitHub Repository
R	R	<a href="#">R source</a>
Ruby	Ruby, JRuby, Rack, Rails, or Sinatra	<a href="#">Ruby source</a>
Staticfile	HTML, CSS, JavaScript, or NGINX	<a href="#">Staticfile source</a>

## Classic Buildpacks

Buildpacks provide framework and runtime support for your apps. Buildpacks typically examine your apps to determine what dependencies to download and how to configure your apps to communicate with bound services.

When you push an app, Cloud Foundry automatically detects an appropriate buildpack for it. This buildpack is used to compile or prepare your app for launch.

Cloud Foundry deployments often have limited access to dependencies. This limitation occurs when the deployment is behind a firewall, or when administrators want to use local mirrors and proxies. In these circumstances, Cloud Foundry provides a Buildpack Packager app. For more information, see the [Buildpack Packager](#) repository on GitHub.

## Cloud Foundry Buildpacks

For information about the existing buildpacks that Cloud Foundry supports, see [CF Buildpack Languages and Sources](#).

## Sidecar buildpacks

For information about deploying a sidecar buildpack, see [Sidecar buildpack](#).

## Community buildpacks

For a list of unsupported, community created buildpacks, see [Community created](#) section of the *Buildpack information for Cloud Foundry v2* page in the cf-docs-contrib repository on GitHub.

## Customizing and developing buildpacks

For information about customizing existing buildpacks and developing new buildpacks, see [Customizing and developing buildpacks](#).

## Using continuous integration for buildpacks

For information about updating and releasing a new version of a Cloud Foundry buildpack through the Cloud Foundry Buildpacks Team Concourse pipeline, see [Using CI for buildpacks](#). You can use this topic as a model when working with Concourse to build, and release new versions of your own buildpacks.

# Using Classic Buildpacks in Cloud Foundry

This section provides links to additional information about using buildpacks. Each of the following topics are applicable to all supported buildpack languages and frameworks:

- [Working with buildpacks in Cloud Foundry](#)
- [Stack association](#)
- [Pushing an app with multiple buildpacks](#)
- [Using a proxy](#)
- [Supported binary dependencies](#)
- [Configuring the production server.](#)

## Binary buildpack

Use the binary buildpack to run arbitrary binary web servers.

### Push an app

Specify the binary buildpack to stage an app as a binary file. On a command line, use `cf push MY-AWESOME-APP` with the `-b` option to specify the buildpack.

For example:

```
$ cf push MY-AWESOME-APP -b https://github.com/cloudfoundry/binary-buildpack.git
```

You can provide Cloud Foundry with the shell command to run your binary in the following two ways:

- **Procfile:** In the root directory of your app, add a `Procfile` that specifies a `web` task:

```
web: ./app
```

- **Command line:** Use `cf push MY-AWESOME-APP` with the `-c` option:

```
$ cf push MY-AWESOME-APP -c './app' -b binary_buildpack
```

## Compile your binary

Cloud Foundry expects your binary to bind to the port specified by the `PORT` environment variable.

The following example in `Go` binds a binary to the `PORT` environment variable:

```
package main

import (
    "fmt"
    "net/http"
    "os"
)
```

```

func handler(w http.ResponseWriter, r *http.Request) {
    fmt.Fprintf(w, "Hello, %s", "world!")
}

func main() {
    http.HandleFunc("/", handler)
    http.ListenAndServe(": "+os.Getenv("PORT"), nil)
}

```

Your binary should run without any additional runtime dependencies on the cflinuxfs3 or lucid64 root filesystem (rootfs). Any such dependencies should be statically linked to the binary.



To avoid security exposure, verify that you migrate your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

To boot a Docker container running the cflinuxfs3 filesystem, run the following command:

```
$ docker run -it cloudfoundry/cflinuxfs3 bash
```

To boot a Docker container running the lucid64 filesystem, run the following command:

```
$ docker run -it cloudfoundry/lucid64 bash
```

To compile the above Go application on the rootfs, golang must be installed. `apt-get install golang` and `go build app.go` will produce an `app` binary.

When deploying your binary to Cloud Foundry, use `cf push` with the `-s` option to specify the root filesystem it should run against.

```
$ cf push MY-AWESOME-APP -s (cflinuxfs3|lucid64)
```

## BOSH configured custom trusted certificate support

Your platform operator can configure the platform to add the custom certificates into the application container. The custom trusted certificates are added to the `/etc/ssl/certs` directory and can be used by binary applications.

For more information, see [Configuring Trusted System Certificates for Applications](#).

## .NET apps

### .NET Core on Windows

To run .NET Core apps on the Windows stack, you must use the Binary buildpack. Follow the steps below to configure your Cloud Foundry manifest appropriately.

1. In the app manifest file, specify the `windows` stack and a custom start command. This file should be in the same folder as your `.csproj` file and be marked **copy always**.

```
---
applications:
- name: MY-AWESOME-APP
  stack: windows
  command: cmd /c .\MY-AWESOME-APP --urls=http://0.0.0.0:%PORT%
```

2. Publish the project using the dotnet CLI or Visual Studio.

```
$ dotnet publish -o ./publish -r win10-x64 -f netcoreapp2.1
```

3. A `publish` folder should now exist. Navigate to this `publish` folder and verify the `manifest.yml` file exists. Run `cf push` to deploy your app.

```
$ cd publish
$ cf push MY-AWESOME-APP
```

## .NET Framework

To run a self hosted application using OWIN or another kind of .NET Framework app that requires a TCP port, compile the app to `myapp.exe` and use the Binary buildpack. For an example, see the following manifest:

```
applications:
- name: MY-AWESOME-APP
  stack: windows
  command: cmd /c .\MY-AWESOME-APP --server.urls=http://0.0.0.0:%PORT%
```

## Console Apps

Console apps are not recommended to run on Cloud Foundry because they do not normally run as a single instance and are not highly available. If you need to run a console app on Cloud Foundry, see [Console Applications](#) in the .NET Cookbook.

For information about deploying different types of .NET apps, follow the links in the table below.

Type of .NET App	Buildpack
ASP.NET MVC	HWC
ASP.NET Web Forms	
ASP.NET WebAPI Apps	
Windows Communication Foundation (WCF)	
.NET Core pushed to Linux stack	.NET Core

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need any further assistance.

For more information about using and extending the binary buildpack in Cloud Foundry, see the [binary-buildpack GitHub repository](#).

You can find current information about this buildpack on the [binary buildpack release page](#) in GitHub.

## Go buildpack

## Supported versions

You can find supported Go versions in the Cloud Foundry [release notes](#).

## Push an app

The Go buildpack is automatically detected in the following circumstances:

- Your app has been packaged with `godep` using `godep save`.
- Your app has a `vendor/` directory and has any files ending with `.go`.
- Your app has a `GOPACKAGENAME` environment variable specified and has any files ending with `.go`.
- Your app has a `glide.yml` file and is using `glide`, starting in buildpack version [1.7.9](#).
- Your app has a `Gopkg.toml` file and is using `dep`, starting in buildpack version [1.8.9](#).

If your Cloud Foundry deployment does not have the Go Buildpack installed, or the installed version is out of date, you can use the latest version with the command:

```
$ cf push my_app -b https://github.com/cloudfoundry/go-buildpack.git
```

When you specify versions, specify only major or minor versions, such as Go 1.6, rather than Go 1.6.0. This ensures you receive the most recent patches.

## Start command

When pushing Go apps, you can specify a start command for the app. You can place the start command in the `Procfile` file in root directory of your app. For example, if the binary generated by your Go project is `my-go-server`, your `Procfile` could contain the following:

```
web: my-go-server
```

For more information about Procfiles, see the [Configuring a Production Server](#) topic.

You can also specify the start command for your app in the `manifest.yml` file in the root directory. For example, your `manifest.yml` could contain the following:

```
---
applications:
- name: my-app-name
  command: my-go-server
```

If you do not specify a start command in a `Procfile`, in the manifest, or with the `-c` flag for `cf push`, the generated binary is used as the start command. Example: `my-go-server`

## Push an app with Go modules

As of Go 1.11 you can use the `go mod` vendoring tool that comes with Go. If you are using `go mod` to package your dependencies, make sure that you have created a valid `go.mod` file in the root directory of your app by running `go mod init`.

### Go sample app

- Sample Go app

An example `go.mod` file:

```
module go-online

require (
    github.com/BurntSushi/toml v0.3.1
    github.com/satori/go.uuid v1.2.0
)
```

## When your main package is not in the project root

A common project pattern is to place main packages in a subdirectory called `cmd` like in the example below:

```
$ tree app-package-name
app-package-name
├── cmd
│   ├── cli
│   │   └── main.go
│   └── server
│       └── main.go
├── go.mod
├── go.sum
├── shared.go
└── shared_test.go
└── manifest.yml
```

When you configure your project like this, set the environment variable `GO_INSTALL_PACKAGE_SPEC` to `$MODULE_NAME/$MAIN_PACKAGE_PATH`.

If the module name for the above `app-package-name` app is `example.com/user/app-package-name`, the value of `GO_INSTALL_PACKAGE_SPEC` must be `example.com/user/app-package-name/cmd/server`.

If you want to put this in your `manifest.yml`, see the following example:

```
---
applications:
- name: app-package-name
  env:
    GO_INSTALL_PACKAGE_SPEC: example.com/user/app-package-name/cmd/server
```

## Push an app with godep

If you are using `godep` to package your dependencies, make sure that you have created a valid `Godeps/Godeps.json` file in the root directory of your app by running `godep save`.

When using `godep`, you can fix your Go version in `GoVersion` key of the `Godeps/Godeps.json` file.

### Go sample app

- Sample Go app

An example `Godeps/Godeps.json`:

```
{
  "ImportPath": "go_app",
  "GoVersion": "go1.6",
  "Deps": []
}
```

## Push an app with Glide

If you use `glide` to specify or package your dependencies, make sure that you have created a valid `glide.yml` file in the root directory of your app by running `glide init`.

To vendor your dependencies before pushing, run `glide install`. This generates a `vendor` directory and a `glide.lock` file specifying the latest compatible versions of your dependencies. You must have a `glide.lock` file when pushing a vendored app. You do not need a `glide.lock` file when deploying a non-vendored app.

### Glide

- Sample Go app with Glide

An example `glide.yml` file:

```
package: go_app_with_glide
import:
- package: github.com/ZiCog/shiny-thing
  subpackages:
    - foo
```

You can specify Go version in the `manifest.yml` file:

```
---
applications:
- name: my-app-name
  env:
    GOVERSION: go1.8
```

## Push an app with dep

If you use `dep` to specify or package your dependencies, make sure that you have created a valid `Gopkg.toml` file in the root directory of your app by running `dep init`.

To vendor your dependencies before pushing, run `dep ensure`. This generates a `vendor` directory and a `Gopkg.lock` file specifying the latest compatible versions of your dependencies. You must have a `Gopkg.lock` file when pushing a vendored app. You do not need a `Gopkg.lock` file when deploying a non-vendored app.

### dep

- Sample Go app with dep

An example `Gopkg.toml` file:

```
[[constraint]]
branch = "main"
name = "github.com/ZiCog/shiny-thing"
```

You can specify Go version in the `manifest.yml` file:

```
---
applications:
- name: my-app-name
  env:
    GOVERSION: go1.8
```

## Push an app without a vendoring tool

You can use Go without a vendoring tool by packaging all local dependencies in the `vendor/` directory, and by specifying the app package name in the `GOPACKAGENAME` environment variable.

An example `manifest.yml`:

```
---
applications:
- name: my-app-name
  command: go-online
  env:
    GOPACKAGENAME: example.com/user/app-package-name
```

## Pass a symbol and string to the Go Linker

The Go buildpack supports the Go [linker's](#) ability, `-x symbol value`, to set the value of a string at link time. Set the `GO_LINKER_SYMBOL` and `GO_LINKER_VALUE` in the application's configuration before pushing code.

This can be used to embed the commit SHA or other build-specific data directly into the compiled executable.

For a sample Go app, see the [go-buildpack](#) repository on GitHub.

## C dependencies

The Go buildpack supports building with C dependencies using `cgo`. You can set config vars to specify `cgo` flags to, for example, specify paths for vendored dependencies. As an example, to build `gopgsqldriver`, add the config var `CGO_CFLAGS` with the value `-I/app/code/vendor/include/postgresql` and include the relevant Postgres header files in `vendor/include/postgresql/` in your app.

## Proxy support

If you need to use a proxy to download dependencies during staging, you can set the `http_proxy` and/or `https_proxy` environment variables. For more information, see [Using a Proxy](#).

## BOSH configured custom trusted certificate support

Go uses certificates stored in `/etc/ssl/certs`. Your platform operator can configure the platform to add the custom certificates into the application container.

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need any further assistance.

For more information about using and extending the Go buildpack in Cloud Foundry, see the [go-buildpack GitHub repository](#).

You can find current information about this buildpack on the Go buildpack [release page](#) in GitHub.

## HWC (.NET Framework)

In this section:

- [HWC buildpack](#)
- [Creating an extension buildpack for .NET apps](#)
- [Tips for .NET Framework developers](#)

## HWC buildpack

You can configure .NET Framework apps to use with the Hosted Web Core (HWC) buildpack and push your .NET Framework apps to VMware Tanzu Application Service for VMs [Windows].

## Prerequisites

Using the HWC buildpack requires deploying Microsoft Windows cells with TAS for VMs [Windows].

The HWC buildpack supports the following common app types by default:

- ASP.NET MVC
- ASP.NET Web Forms
- ASP.NET WebAPI Apps
- Windows Communication Foundation (WCF)

For information about deploying different types of .NET apps, follow the links in the following table:

Type of .NET App	Buildpack
.NET Console	Binary
.NET Core pushed to Linux stack	.NET Core
.NET Core pushed to Windows stack	Binary

## HWC buildpack overview

The HWC buildpack provides a runtime server that uses the Hosted Web Core API for running .NET Framework applications in Windows Server containers. For more information, see [Hosted Web Core API Reference](#) in the Microsoft documentation.

The HWC buildpack provides access to .NET Framework 4.5.1 and later, made available by the Windows root file system (rootfs).

## Step 1. Configure HWC

HWC relies on `Web.config` and `applicationHost.config` configuration files for configuring the .NET applications.

Most `Web.config` files work immediately with TAS for VMs [Windows], but with the following constraints:

- Integrated Windows Authentication (IWA) is not yet supported on TAS for VMs [Windows].
- SQL server connection strings must use fully qualified domain names.
- Place connection string values in environment variables or [user-provided service instances](#).

In addition, the [Shadow Copy Setting](#), and [Dynamic and Static HTTP Compression](#) `Web.config` settings can be customized as needed.

The HWC buildpack includes a default configuration for the `applicationHost.config`, similar to IIS.

## Step 2. Add a global error handler

Before you push your app for the first time, add a global error handler to receive log information from your app if it crashes on startup.

## Step 3. Pushing an app

Follow these steps to push your application:

1. Build your HWC app in Visual Studio.
2. On the command line, go to the directory containing the app files.
3. To push your HWC app, run the following `cf push` command:

```
cf push APP-NAME -s windows -b hwc_buildpack
```

Where `APP-NAME` is the name you want to give your app.

For example:

```
$ cf push my-app -s windows -b hwc_buildpack
Creating app my-app in org sample-org / space sample-space as username@example.com...
OK
...
requested state: started
instances: 1/1
usage: 1 GB x 1 instances
urls: my-app.example.com
```

4. Confirm your application is running by going to your app's URL in the push command output. In the previous example, `my-app.example.com` is the URL of your app.

# Features

You can use the following features with HWC buildpack:

- Context Path Routing
- Shadow Copy Setting
- Dynamic and Static HTTP Compression
- URL Rewrite
- Profile Scripts

## Context path routing

With context path routing you can implement multiple apps to share the same route hostname. For example, `app1.example.com/app2`. The context path routing feature is analogous to IIS virtual directories.

Making an application accessible under another app's URL requires pushing both apps and applying a map-route correlation between them. To define a context path route, for example, `app1.example.com/app2`, run the following commands:

1. To push the primary app, run the following command:

```
cf push TOP-LEVEL-APP-NAME -s windows -b hwc_buildpack
```

Where `TOP-LEVEL-APP-NAME` is your top-level app's name.

2. To push the secondary app and deactivate the app's starting and default routing, run the following command:

```
cf push LOWER-LEVEL-APP-NAME --no-start --no-route -s windows -b hwc_buildpack
```

Where `LOWER-LEVEL-APP-NAME` is the name of the lower-level app.

3. To map routes between the primary and secondary apps, run the following command:

```
cf map-route LOWER-LEVEL-APP-NAME APP-DOMAIN --hostname TOP-LEVEL-APP-NAME --path LOWER-LEVEL-APP-NAME
```

Where:

- `TOP-LEVEL-APP-NAME` is your top-level app's name.
- `LOWER-LEVEL-APP-NAME` is your lower-level app's name.
- `APP-DOMAIN` is your site's public domain name.

4. To start the secondary app, run the following command:

```
cf start LOWER-LEVEL-APP-NAME
```

Where `LOWER-LEVEL-APP-NAME` is your lower-level app's name.

For example, the following commands define context path routing for two HWC apps, `app1` and `app2`, where `app2` is made accessible under `app1` as `app1.example.com/app2`:

```
$ cf push app1 -s windows -b hwc_buildpack
$ cf push app2 --no-start --no-route -s windows -b hwc_buildpack
$ cf map-route app2 example.com --hostname app1 --path app2
$ cf start app2
```

HWC-hosted apps use the `VCAP_APPLICATION` environment variable to read out the bound app URIs. Any context path that exists underneath the root in the app's bound route corresponds to the `applicationHost.config`.

## Shadow Copy setting

**Shadow Copy** is a hosting option that copies assemblies for an app in the `bin` directory to the app's temporary files directory. This feature is turned off and is unnecessary for apps running under Cloud Foundry. An app can override this setting in its `Web.config` file.

## Dynamic and static HTTP compression

The HWC buildpack implements dynamic and static HTTP compression by default. You can deactivate HTTP compression in your app's `Web.config` file.

Dynamic HTTP compression is hardcoded at level 4. Static HTTP compression is hardcoded at level 9.

## URL rewrite

The HWC buildpack supports the URL Rewrite module. It's preinstalled in the Windows file system.

## Profile scripts

With the HWC buildpack you can provide `.profile.bat` scripts with your applications. You can use a `.profile.bat` script to perform app-specific initialization tasks. For example, setting custom environment variables.

For information about configuring `.profile.bat` scripts, see [Configure Pre-Runtime Hooks](#) section of [Pushing an App](#).

## Buildpack support

A number of channels exist to assist you with using the HWC buildpack, or developing your own HWC buildpack.

- **HWC Buildpack Repository in GitHub:** For more information about using and extending the HWC buildpack in the [HWC buildpack repository] see, <https://github.com/cloudfoundry/hwc-buildpack> in GitHub.
- **Release Notes:** For more information about this buildpack, see [HWC buildpack release page](#) in GitHub.
- **Slack:** Join the `#buildpacks` channel in the [Cloud Foundry Slack community](#).

## Creating an extension buildpack for .NET apps

You can write extension buildpacks for your .NET apps.

Most .NET Framework apps are pushed with the [Hosted Web Core \(HWC\) buildpack](#).

The HWC buildpack contains the commonly required .NET dependencies used by .NET apps. This set of HWC buildpack dependencies is a subset entire gamut of possible .NET dependencies and does not contain all the DLLs that every app could need.

An extension buildpack supplies a custom set of .NET dependencies to an app's container.

You cannot add modules or extensions directly to the HWC buildpack. If the HWC buildpack lacks dependencies your app requires, VMware recommends that you create an extension buildpack containing the missing dependencies required by your app.

The HWC buildpack contains a number of built in HWC features. For example, the URL Rewrite and HTTP compression modules. Extensions should only provide additional functionality to your app. For more information about existing HWC features, see [Features](#) in *HWC Buildpack*.

For additional extension buildpack configuration and creation commands, see the [Creating custom buildpacks](#).

## Prerequisites

- Linux or MacOS development machine or VM
- [golang](#) v1.10 or later programming language
- [direnv](#) environment variable manager for your shell

## Step 1: Initializing an extension buildpack

The [buildpack-packer](#) provides boilerplate code that you can use to start writing your buildpack.

1. To install the [buildpack-packer](#) CLI tool, run:

```
go get github.com/cloudfoundry/libbuildpack/
go install github.com/cloudfoundry/libbuildpack/tree/master/packager
```

2. To create your buildpack boilerplate, run:

```
buildpack-packer init --name BUILDPACK-NAME --path=BUILDPACK-DIRECTORY
```

Where:

- **BUILDPACK-NAME** is the name of the buildpack you are creating.
- **BUILDPACK-DIRECTORY** is the directory where the boilerplate code is written. If the directory does not exist, it is created by the [buildpack-packer init](#) process.

3. To activate direnv in your buildpack directory, run:

```
cd BUILDPACK-DIRECTORY
direnv allow
```

Where **BUILDPACK-DIRECTORY** is the directory created by the [buildpack-packer](#) command, containing the boilerplate code.

## Step 2: Creating an extension buildpack to supply additional DLLs to a .NET Framework app

An extension buildpack provides the dependencies required by your app that are missing in HWC buildpack. The extension buildpack references and supplies needed dependencies to the app's container when you push the app.

To create an extension buildpack containing additional DLLs:

1. Create a list of the dependencies that your published app requires.
2. Copy the DLLs for the dependencies into a ZIP file.
3. On the command line, browse to the directory containing the new ZIP file.
4. To generate a SHA for your ZIP file, run the following command:

```
shasum -a256 DLL-ZIP-FILE
```

Where `DLL-ZIP-FILE` is the name of your DLL ZIP file.

5. Upload the ZIP file containing your dependencies to a private web server that is accessible by Cloud Foundry. You can also use an S3 bucket or Azure Storage.
6. On the command line, browse to the directory created by the `buildpack-packager init` command above.
7. Edit the `manifest.yml` file by adding a `dependency` section that references the DLL ZIP file as follows:

```
dependencies:
- name: BINARY-NAME
  uri: http://s3.amazonaws.com/BUCKET-NAME/DLL-ZIP-FILE
  version: 0.0.1
  sha256: GENERATED-SHA-256
  cf_stacks:
    - windows
```

Where:

- `BINARY-NAME` is the name of your binary application.
  - `BUCKET-NAME` is your S3 bucket name.
  - `DLL-ZIP-FILE` is the name of your DLL ZIP file.
  - `GENERATED-SHA-256` is the generated SHA.
8. Ensure the `include_files` section of the manifest contains `bin/supply.exe`.
  9. To navigate to the `BUILDPACK-DIRECTORY/src/BUILDPACK-NAME/` directory, use either Windows Explorer, or your text editor's 'File - Open' option.
  10. Edit the `supply.go` script.
  11. Add dependencies to the container's `PATH` as follows:
    1. Add a `stager.InstallDependency` for the `dependency` and `version` you have in your `manifest.yml` file.

- Add a `s.stager.AddBinDependency` for every DLL file you want your app to be able to access. For example:

```
dep := libbuildpack.Dependency{Name: "my-binary", Version: "0.0.1"}
if err := s.Installer.InstallDependency(dep, s.Stager.DepDir()); err != nil {
    return err
}
if err := s.Stager.AddBinDependencyLink(filepath.Join(s.Stager.DepDir(),
    "MyBinary.dll"), "MyBinary.dll"); err != nil {
    return err
}
```

- To configure the build.sh script to cross-compile, edit `scripts/build.sh` to include the following:

```
GOOS=windows go build -ldflags="-s -w" -o bin/supply.exe mysql/supply/cli
```

## Step 3: Building the extension buildpack

To build a cached extension buildpack artifact:

- Run:

```
buildpack-packager build -cached -stack STACK-NAME
```

Where `STACK-NAME` is the pre-built operating system that can run apps.

If the buildpack's `supply.go` script contains a mistake, `buildpack-packager` throws an error. Don't push your app with the new extension `buildpack` until after all local errors have been corrected. You must push your app to determine whether the new extension buildpack functions as intended.

## Step 4: Validating the extension buildpack

To push an app with the cached extension buildpack artifact:

- Upload the buildpack to a private web server accessible to Cloud Foundry. You can upload the finished buildpack to the same web server as your dependencies. You can also use an S3 bucket or Azure Storage.
- To deploy your app with the extension buildpack and determine whether the new buildpack functions as intended, run:

```
cf push APP-NAME -s windows -b EXT-BUILDPACK-URL -b hwc_buildpack
```

Where:

- `APP-NAME` is your app's name.
- `EXT-BUILDPACK-URL` is the URL of the uploaded extension buildpack ZIP file.

If your extension buildpack does not include the correct dependencies, you receive an error message.

## Step 5: Combine an extension buildpack with other features

If your extension buildpack has executables or scripts that need to be run, you can reference them either in the start command or in profile scripts.

- For more information about the start command, see [command](#) in *Deploying with Application Manifests*.
- For more information about profile scripts, see [Configure Pre-Runtime Hooks](#) in *Deploying an Application*.

## Tips for .NET Framework developers

You can push .NET Framework apps to VMware Tanzu Application Service for VMs [Windows] Diego Cells.

For information about how to develop microservices for .NET Framework and .NET Core using Steeltoe, see the [Steeltoe documentation](#).

## Prerequisites

- You have installed and configured the TAS for VMs [Windows] tile must be installed and configured. To install TAS for VMs [Windows], see [Installing and configuring TAS for VMs \[Windows\]](#). After you install and configure the TAS for VMs [Windows] tile, developers can push .NET Framework apps to the Windows Diego Cell. Developers can push both [OWIN](#) and non-OWIN apps, and can push apps that are self-hosted or served by Hostable Web Core.
- You have installed the Cloud Foundry Command Line Interface (cf CLI). For information about installing the cf CLI, see [Installing the cf CLI](#).



If you upgrade to TAS for VMs [Windows] and have apps that you want to migrate, see [Upgrading Windows Diego Cells](#).

## Developing .NET Framework apps

### .NET on Operations Manager cookbook

For useful tips and recipes for migrating and developing .NET Framework apps to run on TAS for VMs [Windows], see the [.NET Cookbook](#).

## Pushing a .NET Framework app

By default, Operations Manager serves .NET Framework apps with Hostable Web Core (HWC). HWC is a lighter version of the Internet Information Services (IIS) server that contains the core IIS capability.

To push a .NET Framework app to a Windows Diego Cell:

1. Target the Cloud Controller of your Operations Manager deployment by running:

```
cf api api.APP-DOMAIN
```

Where `APP-DOMAIN` is your app's public domain name. For example, `example.com`.

2. Run one of these commands to deploy your .NET app:

- o To deploy an app with `.bat` or `.exe` files, run:

```
cf push -s windows -b binary_buildpack
```

- o To deploy a .NET Framework app, run:

```
cf push APP-NAME -s windows -b hwc_buildpack
```

Where `APP-NAME` is the name of your app.

The `-s windows` command instructs Operations Manager to run the app in the Windows Diego Cell. If you are not pushing your app from its directory, use the `-p` command and specify the path to the directory that contains the app.

3. Wait for your app to stage and start. If you see an error message, see [Troubleshoot app errors](#).

## Context path routing support for ASP.NET apps

With context path routing, you can activate multiple apps to share the same route host name. For example, `app1.example.com/app2`. If you use ASP.NET you can host apps under a route path. Within Windows Diego Cells, you can have multiple routes to an app, but those routes cannot have different context paths.

To make an app accessible under another app's URL requires a pair of commands.

To define a context path route, such as `app1.example.com/app2`:

1. Push the top level app by running:

```
cf push TOP-LEVEL-APP-NAME
```

Where `TOP-LEVEL-APP-NAME` is the name of your top-level app.

2. Push the lower-level app by running:

```
cf push LOWER-LEVEL-APP-NAME -d APP-DOMAIN --hostname TOP-LEVEL-APP-NAME --route e-path LOWER-LEVEL-APP-NAME
```

Where:

- o `TOP-LEVEL-APP-NAME` is the name of your top-level app.
- o `LOWER-LEVEL-APP-NAME` is the name of your lower-level app.
- o `APP-DOMAIN` is your app's public domain name. For example, `example.com`.



The `-d` parameter is needed only when you push an app to a non-default domain. You can use the `routes` property in the manifest instead.

## Activating a graceful shutdown for a .NET app

Developers can configure .NET apps to shut down gracefully after running the `cf stop` command. When you run the `cf stop` command, the .NET app receives a `CTRL_SHUTDOWN_EVENT` response and is allowed ten seconds to shut down. To activate graceful shutdown, you must include a control handler in the app.

For more information, see [Graceful Shutdown](#) in the .NET Cookbook.

## Pushing a self-hosted app

Developers can choose to push a self-hosted app instead of using Hostable Web Core. Self-hosted apps combine server code with the app code.

To push a self-hosted app:

1. Target the Cloud Controller of your Operations Manager deployment by running:

```
cf api api.APP-DOMAIN
```

Where `APP-DOMAIN` is your app's public domain name. For example, `example.com`.

2. Push your .NET app from the app root by running:

```
cf push APP-NAME -s windows -b binary_buildpack -c PATH-TO-BINARY
```

Where:

- `APP-NAME` is the name of your app.
- `PATH-TO-BINARY` is the path to your executable file.

3. Wait for your app to stage and start. If you see an error message, see [Troubleshoot app errors](#).

## Push a SOAP service

Developers can push Simple Object Access Protocol (SOAP) web services to their Operations Manager deployment by using the procedures in the following sections.

### Step 1: Deploy your web service

To deploy a SOAP web service:

1. Develop the service as an ASMX web service in Microsoft Visual Studio.
2. Publish the service to your local file system.
3. Open a command line shell and go to the directory containing the published web service.
4. Push your service by running:

```
cf push SOAP-SERVICE-NAME -s windows -b hwc_buildpack -p WEB-SERVICE-DIRECTORY
-u none
```

Where:

- `SOAP-SERVICE-NAME` is the name of your service.
- `WEB-SERVICE-DIRECTORY` is the path to the directory containing the published web service.

For example:

```
$ cf push webservice -s windows -b hwc_buildpack -u none

requested state: started
instances: 1/1
usage: 1G x 1 instances
urls: webservice.example.com
```

The push command must include the `-s` flag to specify the stack, which instructs Operations Manager to run the app in the Windows Diego Cell.

The `-p` and `-u` parameters are optional. The `-p` parameter is needed only when you push your service from a directory that does not contain the published web service. The `-u` parameter is needed only when you deactivate the health check when you do not have a route serving `/`.

5. Confirm your service is running by finding your service URL in the push command output and browsing to it. In the previous example, the URL for the service is

<http://webservice.example.com>.

## Step 2: Edit the WSDL file

Your SOAP web service is now deployed on Operations Manager, but the service WSDL file contains incorrect port information. The WSDL file must be edited to allow an app to consume your web service. Either you or the service developer can perform the needed modification, as shown in this example:

```
- <wsdl:service name="WebService1">
  - <wsdl:port name="WebService1Soap" binding="tns:WebService1Soap">
    <soap:address location="http://webservice.example.com:62492/WebService1.asmx"/>
  </wsdl:port>
  - <wsdl:port name="WebService1Soap12" binding="tns:WebService1Soap12">
    <soap12:address location="http://webservice.example.com:62492/WebService1.asmx"/>
  </wsdl:port>
-</wsdl:service>
```

The WSDL file provides the port number for the SOAP web service as `62492`. This is the port that the web service listens on in the Garden container, but external apps cannot access the service on this port. Instead, external apps must use port 80, and the Gorouter routes requests to the web service in the container. For more information about the Garden container, see [Container Mechanics](#) in [Container Security](#).

For more information about the Gorouter, see [TAS for VMs routing architecture](#).

The URL of the web service in the WSDL file must be modified to remove `62492`. With no port number, the URL default is port 80. In the previous example, the modified URL is

<http://webservice.example.com/WebService1.asmx>.

SOAP web service developers can resolve this problem in one of two ways:

- Edit the WSDL file by following the instructions in the [Microsoft documentation](#) from the Microsoft Developers Network.
- Instruct the developers of external apps that consume the web service to follow the procedure in [Consuming SOAP Web Service](#).

## Consuming SOAP Web Service

Developers of external apps that consume the SOAP web service can use a modified version of the WSDL file.

To use a modified version of the WSDL file:

1. In a browser, go to the WSDL file of the web service, using the following URL:

```
https://SOAP-SERVICE-NAME.APP-DOMAIN/ASMX-FILE?wsdl
```

Where:

- `SOAP-SERVICE-NAME` is the name of your service.
- `APP-DOMAIN` is your site's public domain name.
- `ASMX-FILE` is the filename of your asmx file.

For example:

```
https://webservice.example.com/WebService1.asmx?wsdl
```

2. Download the WSDL file to your local machine.
3. Edit the WSDL file to delete the container port, as described in [Edit the WSDL file](#).
4. In Microsoft Visual Studio, right-click your app in the **Solution Explorer** and select **Add > Service Reference**.
5. In **Address**, enter the local path to the modified WSDL file.

For example:

```
C:\Users\example\wsdl.xml
```

6. Click **OK**.

Microsoft Visual Studio generates a client from the WSDL file that you can use in your codebase.

## Context path routing support for SOAP Web Services

Developers can push SOAP web services to their Operations Manager deployment with context path routing.

For more information, see [Context path routing support for ASP.NET apps](#).

## Troubleshooting app errors

If a .NET app does not start, review this list of errors and possible solutions:

- `NoCompatibleCell`: Your Operations Manager deployment cannot connect to your Windows Diego Cell. For more information about troubleshooting your Windows Diego Cell configuration, see [Troubleshooting Windows Diego Cells](#).
- `Start unsuccessful`: Your app might be configured wrong or lacks the required DLL files and dependencies. Verify that:

- Your app directory contains either a valid `.exe` binary or a valid `Web.config` file.
- You are pushing from a directory containing your app dependencies. If it does not, specify the app dependency directory with the `-p` flag.

## Java

In this section:

- [Java buildpack](#)
- [Using Cloud Foundry Java buildpack](#)
- [Cloud Foundry Java Client Library](#)
- [Using Java Native Image buildpack](#)
- [Configuring service connections](#)

## Java buildpack

You can use the Java buildpack with apps written in Grails, Play, Spring, or any other JVM-based language or framework.

For information about specific versions, see [Java Buildpack Release Notes](#). You can find the source for the Java buildpack in the [Java buildpack repository](#) on GitHub.

## Buildpack and application logging

The Java buildpack only runs during the staging process, and only logs staging information such as the downloaded components, configuration data, and work performed on your application by the buildpack.

The Java buildpack source documentation states the following:

- The Java buildpack logs all messages, regardless of severity, to `APP-DIRECTORY/.java-buildpack.log`. The buildpack also logs messages to `$stderr`, filtered by a configured severity level.
- If the buildpack fails with an exception, the exception message is logged with a log level of `ERROR`. The exception stack trace is logged with a log level of `DEBUG`. This prevents users from seeing stack traces by default.

Once staging completes, the buildpack stops logging then the Loggregator handles application logging.

Your application must write to `STDOUT` or `STDERR` for its logs to be included in the Loggregator stream. For more information about logging, see [App Logging in TAS for VMs](#).

## BOSH custom trusted certificate support

Versions 3.7 and later of the Java buildpack support BOSH configured custom trusted certificates. For more information, see [Configuring Trusted Certificates](#) in the BOSH documentation.

The Java buildpack pulls the contents of `/etc/ssl/certs/ca-certificates.crt` and `$CF_INSTANCE_CERT/$CF_INSTANCE_KEY` by default.

The log output for Diego Instance Identity-based `KeyStore` appears as follows:

```
Adding System Key Manager
Adding Key Manager for /etc/cf-instance-credentials/instance.key and /etc/cf-
instance-credentials/instance.crt
Start watching /etc/cf-instance-credentials/instance.crt
Start watching /etc/cf-instance-credentials/instance.key
Initialized KeyManager for /etc/cf-instance-credentials/instance.key and /et
c/cf-instance-credentials/instance.crt
```

The log output for Diego Trusted Certificate-based `TrustStore` appears as follows:

```
Adding System Trust Manager
Adding TrustManager for /etc/ssl/certs/ca-certificates.crt
Start watching /etc/ssl/certs/ca-certificates.crt
Initialized TrustManager for /etc/ssl/certs/ca-certificates.crt
```

## Memory constraints

The memory calculator in the Java buildpack accounts for the following memory regions:

- `-Xmx`: Heap
- `-XX:MaxMetaspaceSize`: Metaspace
- `-Xss`: Thread Stacks
- `-XX:MaxDirectMemorySize`: Direct Memory
- `-XX:ReservedCodeCacheSize`: Code Cache
- `-XX:CompressedClassSpaceSize`: Compressed Class Space

Most applications run if they use the Cloud Foundry default container size of 1 G without any modifications. However, you can configure those memory regions directly as needed.

The Java buildpack optimizes for all non-heap memory regions first and leaves the remainder for the heap.

The Java buildpack prints a histogram of the heap to the logs when the JVM encounters a terminal failure.

## Using Cloud Foundry Java buildpack

You can use the Java buildpack with Cloud Foundry.

You can deploy a number of different JVM-based artifact types. For a more detailed explanation of what the Cloud Foundry Java Buildpack supports, see [Additional Documentation](#) in the repository on GitHub.

## Java buildpack

For information about using, configuring, and extending the Cloud Foundry Java buildpack, see the [Cloud Foundry Java Buildpack](#) repository on GitHub.

## Java buildpack design

The Java buildpack can convert artifacts that run on the JVM into executable apps. It does this by identifying one of the supported artifact types (Grails, Groovy, Java, Play Framework, Spring Boot, and Servlet) and downloading all additional dependencies needed to run. It also analyzes the collection of services bound to the app and downloads any dependencies related to those services.

For example, pushing a WAR file that is bound to a PostgreSQL database and New Relic for performance monitoring shows output like this:

```
----> Java Buildpack v4.50 | https://github.com/cloudfoundry/java-buildpack#e1d6dbc
----> Downloading Jvmkill Agent 1.16.0_RELEASE from https://java-buildpack.cloudfoundry.org/jvmkill/bionic/x86_64/jvmkill-1.16.0-RELEASE.so (0.1s)
----> Downloading Open Jdk JRE 1.8.0_342 from https://java-buildpack.cloudfoundry.org/openjdk/bionic/x86_64/bellsoft-jre8u342%2B7-linux-amd64.tar.gz (0.6s)
Expanding Open Jdk JRE to .java-buildpack/open_jdk_jre (1.3s)
JVM DNS caching deactivated in lieu of BOSH DNS caching
----> Downloading Open JDK Like Memory Calculator 3.13.0_RELEASE from http://java-buildpack.cloudfoundry.org/memory-calculator/bionic/x86_64/memory-calculator-3.13.0-RELEASE.tar.gz (0.1s)
Loaded Classes: 21014, Threads: 250
----> Downloading Client Certificate Mapper 1.11.0_RELEASE from https://java-buildpack.cloudfoundry.org/client-certificate-mapper/client-certificate-mapper-1.11.0-RELEASE.jar (0.0s)
----> Downloading Container Security Provider 1.19.0_RELEASE from https://java-buildpack.cloudfoundry.org/container-security-provider/container-security-provider-1.19.0-RELEASE.jar (0.1s)
Exit status 0
```

## Configuration

In most cases, the buildpack can work without any configuration. If you are new to Cloud Foundry, VMware recommends that you make your first attempts without modifying the buildpack configuration. The buildpack is flexible, though, and you can configure it through environment variables. For more information, see [Configuration and Extension](#) in the Cloud Foundry Java Buildpack repository on GitHub.

## Java Client Library

The Cloud Foundry Client Library provides a Java API for interacting with an instance. This library, `cloudfoundry-client`, can be used by Java based tools to interact with the platform.

For information about using this library, see [Java Cloud Foundry Library](#).

## Grails

Grails packages apps into WAR files for deployment into a Servlet container. To build the WAR file and deploy it, run:

```
grails prod war
cf push YOUR-APP -p target/YOUR-APP-VERSION.war
```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-APP-VERSION` is the name of the WAR file you want to build and deploy.

## Groovy

TAS for VMs supports Groovy apps based on both Ratpack and a simple collection of files.

### Ratpack

Ratpack packages apps into two different styles. TAS for VMs supports the `distZip` style. To build the ZIP file and deploy it, run:

```
gradle distZip
cf push YOUR-APP -p build/distributions/YOUR-ZIP-FILE.zip
```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-ZIP-FILE` is the name of the ZIP file you want to build and deploy.

For more information, see the [Ratpack](#) website.

### Raw Groovy

You can run Groovy apps that are made up of a single entry point and any supporting files without any other work. To deploy them, run:

```
cf push YOUR-APP
```

Where `YOUR-APP` is the name of your app.

For more information, see [Groovy Container](#) in the Cloud Foundry Java Buildpack repository on GitHub.

## HTTP/2

To deploy Java apps that use HTTP/2, you must have:

1. A Cloud Foundry foundation that has HTTP/2 support enabled. For information about configuring support for HTTP/2 in TAS for VMs, see [Configuring HTTP/2 Support](#).
2. Cloud Foundry Command-Line Interface (cf CLI) v8 or later. See [Upgrading to cf CLI v8](#).

You can deploy any Java app and get automatic support for the HTTP/2 protocol without making any changes to your app. When a client connects through a route mapped to your Java apps over HTTP/2, the foundation transparently downgrades the protocol and communicates with your app over HTTP/1.1.

If you require end-to-end HTTP/2, for example, because of gRPC, do the following:

1. Enable HTTP/2 support in the app:
  - See [Configure HTTP/2](#) in the Spring Boot documentation.

- If you are deploying a standard non-executable WAR file, you only need to make sure that you are using Java buildpack v4.43 or later. Starting with v4.43, the Java buildpack configures Apache Tomcat to accept HTTP/2 connections.
  - Other frameworks, including Play, Ratpack, and apps that use the distZip format, embed an HTTP server. You must configure these apps to enable HTTP/2, specifically H2C, clear-text. See your framework’s documentation for enabling HTTP/2 and H2C. H2C is required because TAS for VMs uses Envoy to secure communications into the app container.
2. Configure the route to use the HTTP/2 protocol using either the cf CLI or the app manifest:

- Using the cf CLI: `cf map-route MY-APP EXAMPLE.COM --hostname host --destination-protocol http2`.
- Using a `manifest.yml` file:

```
---
applications:
- name: MY-APP
  routes:
    - route: MY-APP.EXAMPLE.COM
      protocol: http2
```

## HTTP/2 example

For example:

1. Fetch the Spring Music app:

```
git clone https://github.com/cloudfoundry-samples/spring-music.git
```

2. Build the app:

```
./gradle assemble
```

3. Push the app without assigning a route:

```
cf push --no-route
```

4. Map a route:

```
cf map-route spring-music EXAMPLE.COM --hostname spring-music --destination-protocol http2
```

5. Validate:

```
curl https://spring-music.EXAMPLE.COM/request --http2 -s | jq .
```

A successful response looks like the following:

```
{
  "protocol": "HTTP/2.0",
  "remote-addr": "198.51.100.100",
  "method": "GET",
```

```

    "scheme": "https",
    "session-id": "1A891C614AB6B6CB59A56D7F520BBCBD"
}

```

## Java main

Java apps with a `main()` method can be run provided that they are packaged as self-executable JARs. For more information, see [Java Main Container](#) in the Cloud Foundry Java Buildpack repository on GitHub.

If your app is not web enabled, you must suppress route creation to avoid a `failed to start accepting connections` error. To suppress route creation, add `no-route: true` to the app manifest or use the `-no-route` flag with the `cf push` command.

For more information about the `no-route` attribute, see [Deploying with App Manifests](#).

## Maven

A Maven build can create a self-executable JAR. To build and deploy the JAR, run:

```

mvn package
cf push YOUR-APP -p target/YOUR-APP-VERSION.jar

```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-APP-VERSION` is the name of the JAR you want to build and deploy.

## Gradle

A Gradle build can create a self-executable JAR. To build and deploy the JAR, run:

```

gradle build
cf push YOUR-APP -p build/libs/YOUR-APP-VERSION.jar

```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-APP-VERSION` is the name of the JAR you want to build and deploy.

## Play Framework

The Play Framework packages apps into two different styles. TAS for VMs supports both the `staged` and `dist` styles. To build the `dist` style and deploy it, run:

```

play dist
cf push YOUR-APP -p target/universal/YOUR-APP-VERSION.zip

```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-APP-VERSION` is the name of the `dist` style ZIP you want to build and deploy.

For more information, see the [Play Framework](#) website.

## Spring Boot CLI

Spring Boot can run apps comprised entirely of POGOs. To deploy them, run:

```
spring grab *.groovy  
cf push YOUR-APP
```

Where `YOUR-APP` is the name of your app.

For more information, see [Spring Boot](#) on the Spring website and [Spring Boot CLI Container in the Cloud Foundry Java Buildpack repository on GitHub](#).

## Servlet

Java apps can be packaged as Servlet apps.

### Maven

A Maven build can create a Servlet WAR. To build and deploy the WAR, run:

```
mvn package  
cf push YOUR-APP -p target/YOUR-APP-VERSION.war
```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-APP-VERSION` is the name of the WAR you want to build and deploy.

### Gradle

A Gradle build can create a Servlet WAR. To build and deploy the WAR, run:

```
gradle build  
cf push YOUR-APP -p build/libs/YOUR-APP-VERSION.war
```

Where:

- `YOUR-APP` is the name of your app.
- `YOUR-APP-VERSION` is the name of the WAR you want to build and deploy.

## Binding to services

For more information about binding apps to services, see [Configuring Service Connections](#).

## Java and Grails best practices

### Provide a JDBC driver

The Java buildpack does not bundle a JDBC driver with your app. If you want your app to access a SQL RDBMS, include the appropriate driver in your app.

## Allocate sufficient memory

If you do not allocate sufficient memory to a Java app when you deploy it, it may fail to start, or TAS for VMs may terminate it. You must allocate enough memory to allow for:

- Java heap
- Metaspace
- Stack size per Thread
- JVM overhead

The `config/open_jdk_jre.yml` file of the Java buildpack contains default memory size and weighting settings for the JRE. For an explanation of JRE memory sizes and weightings and how the Java buildpack calculates and allocates memory to the JRE for your app, see [Open JDK JRE](#) in the Cloud Foundry Java Buildpack on GitHub.

To configure memory-related JRE options for your app, you can override the default memory settings of your buildpack as described in [Configuration and Extension](#) with the properties listed in the Open JDK JRE README in the Cloud Foundry Java Buildpack on GitHub. For more information about configuring manifests, see [Deploying with App Manifests](#).

To see memory utilization when your app is running, run:

```
cf app YOUR-APP
```

Where `YOUR-APP` is the name of your app.

## Troubleshoot out of memory

A Java app may crash because of insufficient memory on the Garden container or the JVM on which it runs. The sections below provide guidance for help diagnosing and resolving such issues.

### JVM

- **Error:** `java.lang.OutOfMemoryError`. For example:

```
$ cf logs YOUR-APP --recent
2016-06-20T09:18:51.00+0100 [APP/0] OUT java.lang.OutOfMemoryError: Met
aspace
```

Where `YOUR-APP` is the name of your app.

- **Cause:** If the JVM cannot garbage-collect enough space to ensure the allocation of a data-structure, it fails with `java.lang.OutOfMemoryError`. In the example above, JVM has an under-sized `metaspace`. You may see failures in other memory pools, such as `heap`.
- **Solution:** Configure the JVM correctly for your app. For more information, see [Allocate Sufficient Memory](#).

### Garden container

The solutions in this section require configuring the memory calculator, which is a sub project of the Java buildpack that calculates suitable memory settings for Java apps when you push them. For more information, see the [java-buildpack-memory-calculator](#) repository on GitHub. If you have questions about the memory calculator, you can ask them in the **#java-buildpack** channel of the [Cloud Foundry Slack organization](#).

- **Error:** The Garden container terminates the Java process with the out of memory event. For example:

```
$ cf events YOUR-APP
time           event       actor       description
2016-06-20T09:18:51.00+0100 app.crash app-name index: 0, rea
son: CRASHED, exit_description: out of memory, exit_status: 255
```

Where `YOUR-APP` is the name of your app.

This error appears when the JVM allocates more OS-level memory than the quota requested by the app, such as through the manifest.

- **Cause 1 - Insufficient native memory:** This error commonly means that the JVM requires more native memory. In the scope of the Java buildpack and the memory calculator, the term “native” means the memory required for the JVM to work, along with forms of memory not covered in the other classifications of the memory calculator. This includes the memory footprint of OS-level threads, program counters, when an app forks and runs subprocesses, or when an app uses JNI to allocate memory.
- **Solution 1:** Determine how much native memory a Java app needs by measuring it with realistic workloads and fine-tuning it accordingly. You can then configure the Java buildpack using the native setting of the memory calculator, as in the example below:

```
---
applications:
- name: YOUR-APP
  memory: 1G
  env:
    JBP_CONFIG_OPEN_JDK_JRE: '[memory_calculator: {headroom: 10}]'
```

Where `YOUR-APP` is the name of your app.

This example shows that 10% of the overall available `1G` is reserved for anything that is not `heap`, `metaspace`, `direct`, `code cache` or `threads`. In less common cases, this may come from companion processes started by the JVM, such as the Process API.

For more information about measuring how much native memory a Java app needs, see [Native Memory Tracking](#) in the Java documentation. For more information about configuring the Java buildpack using the native setting, see [OpenJDK JRE](#) in the Cloud Foundry Java Buildpack on GitHub. For more information about the Process API, see [Class Process](#) in the Java documentation.

- **Cause 2 - High thread count:** Java threads in the JVM can cause memory errors at the Garden level. When an app is under heavy load, it uses a high number of threads. Each thread consumes some memory, and, if there are enough threads, they consume a significant amount of memory.

- **Solution 2:** Set the reserved memory for stack traces to the correct value for your app.

You can use the `-Xss` setting of the JVM to configure the amount of space the JVM reserves for each Java thread. You must multiply this value by the number of threads your app requires. Specify the number of threads in the `stack_threads` setting of the memory calculator. For example, if you estimate the max thread count for an app at `800` and the amount of memory needed to represent the deepest stacktrace of a Java thread is `512KB`, configure the memory calculator as follows:

```
---
applications:
- name: YOUR-APP
  memory: 1G
  env:
    JBP_CONFIG_OPEN_JDK_JRE: '[memory_calculator: {stack_threads: 800}]'
    JAVA_OPTS: '-Xss512k'
```

Where `YOUR-APP` is the name of your app.

In this example, the overall memory amount reserved by the JVM for representing the stacks of Java threads is  $800 * 512k = 400m$ .

The correct settings for `-Xss` and `stack_threads` depend on your app code, including the libraries it uses. Your app may technically have no upper limit, such as in the case of [cavalier usage of CachedThreadPool executors](#). However, you still must calculate the depth of the thread stacks, and the amount of space the JVM reserves for each of them. For more information, see [Executors.newCachedThreadPool\(\) considered harmful](#) on the Bizo website and the `newCachedThreadPool` section of the *Class Executors* topic in the Java documentation.

## Troubleshoot failed upload

If your app fails to upload when you push it to TAS for VMs, it may be for one of the following reasons:

- **WAR is too large:** An upload may fail due to the size of the WAR file. TAS for VMs testing indicates WAR files as large as 250 MB upload successfully. If a WAR file larger than that fails to upload, it may be a result of the file size.
- **Connection issues:** App uploads can fail if you have a slow Internet connection, or if you upload from a location that is very remote from the target TAS for VMs instance. If an app upload takes a long time, your authorization token can expire before the upload completes. A workaround is to copy the WAR to a server that is closer to the TAS for VMs instance, and then push it from there.
- **Out-of-date cf CLI client:** Upload of a large WAR is faster and therefore less likely to fail if you are using a recent version of the cf CLI. If you are using an older version of the cf CLI client to upload a large WAR, and having problems, try updating to the latest version of the cf CLI.
- **Incorrect WAR targeting:** By default, `cf push` uploads everything in the current directory. For a Java app, `cf push` with no option flags uploads source code and other unnecessary files, in addition to the WAR. When you push a Java app, specify the path to the WAR by running:

```
cf push YOUR-APP -p PATH/TO/WAR-FILE
```

Where:

- YOUR-APP is the name of your app.
- PATH/TO/WAR-FILE is the path to the WAR. You can determine whether or not the path was specified for a previously pushed app by examining the app deployment manifest, `manifest.yml`. If the `path` attribute specifies the current directory, the manifest includes a line like:

```
path: .
```

To re-push just the WAR, do one of the following:

- Delete `manifest.yml` and run `cf push` again, specifying the location of the WAR using the `-p` flag.
- Edit the `path` argument in `manifest.yml` to point to the WAR, and re-push the app.

## Debugging Java apps

Because of the way TAS for VMs deploys your apps and isolates them, it is not possible to connect to your app with the remote Java debugger. Instead, instruct the app to connect to the Java debugger on your local machine.

To set up remote debugging when using BOSH Lite or a TAS for VMs installation:

1. Open your project in Eclipse.
2. Right-click your project, go to **Debug as** and pick **Debug Configurations**.
3. Create a new **Remote Java Application**.
4. Make sure your project is selected, pick **Standard (Socket Listen)** from the **Connection Type** drop down and set a port. Make sure this port is open if you are running a firewall.
5. Click **Debug**.

The debugger is running. If you switch to the Debug perspective, you see your app listed in the Debug panel, and it says `Waiting for vm to connect at port`.

Next, to push your app to TAS for VMs and instruct TAS for VMs to connect to the debugger running on your local machine:

1. Edit your `manifest.yml` file. Set the instances count to 1. If you set this greater than one, multiple apps try to connect to your debugger.
2. Also in `manifest.yml`, add an `env` block and create a variable named `JAVA_OPTS`. For more information about the `env` block, see [Deploying with App Manifests](#).
3. Add the remote debugger configuration to the `JAVA_OPTS` variable: `-agentlib:jdwp=transport=dt_socket,address=YOUR-IP-ADDRESS:YOUR-PORT`.
4. Save the `manifest.yml` file.
5. Run:

```
cf push
```

Upon completion, you can see that your app has started and is now connected to the debugger running in your IDE. You can now add breakpoints and interrogate the app just as you would if it were running locally.

## Slow starting Java or Grails apps

Some Java and Grails apps do not start quickly, and the health check for an app can fail if an app starts too slowly.

The current Java buildpack implementation sets the Tomcat `bindOnInit` property to `false`. This prevents Tomcat from listening for HTTP requests until an app has fully deployed.

If your app does not start quickly, the health check might fail because it checks the health of the app before the app can accept requests. By default, the health check fails after a timeout threshold of 60 seconds.

To resolve this issue, run `cf push` with the `-t TIMEOUT-THRESHOLD` option to increase the timeout threshold. Run:

```
$ cf push YOUR-APP -t TIMEOUT-THRESHOLD
```

or

```
$ cf push YOUR-APP --app-start-timeout TIMEOUT-THRESHOLD
```

Where:

- `YOUR-APP` is the name of your app.
- `TIMEOUT-THRESHOLD` is the number of seconds to which you want to increase the timeout threshold.

The timeout threshold cannot exceed 180 seconds. Specifying a timeout threshold greater than 180 seconds causes the following error:

```
Server error, status code: 400, error code: 100001, message: The app is invalid: health_check_timeout maximum_exceeded</code>
```

## Extension

The Java buildpack can also be easily extended. It creates abstractions for three types of components (containers, frameworks, and JREs) to allow users to easily add functionality. In addition to these abstractions, there are a number of utility classes for simplifying typical buildpack behaviors.

As an example, the New Relic framework looks like this:

```
class NewRelicAgent < JavaBuildpack::Component::VersionedDependencyComponent

  # @macro base_component_compile
  def compile
    FileUtils.mkdir_p logs_dir

    download_jar
    @droplet.copy_resources
  end

  # @macro base_component_release
  def release
  end
```

```

@droplet.java_opts
  .add_javaagent(@droplet.sandbox + jar_name)
  .add_system_property('newrelic.home', @droplet.sandbox)
  .add_system_property('newrelic.config.license_key', license_key)
  .add_system_property('newrelic.config.app_name', '#{application_name}')
  .add_system_property('newrelic.config.log_file_path', logs_dir)
end

protected

# @macro versioned_dependency_component_supports
def supports?
  @application.services.one_service? FILTER, 'licenseKey'
end

private

FILTER = /newrelic/.freeze

def application_name
  @application.details['application_name']
end

def license_key
  @application.services.find_service(FILTER)['credentials']['licenseKey']
end

def logs_dir
  @droplet.sandbox + 'logs'
end

end

```

For more information, see [Design, Extending, and Configuration and Extension](#) in the Cloud Foundry Java Buildpack repository on GitHub.

## Environment variables

You can access environments variable programmatically.

For example, you can obtain `VCAP_SERVICES` by running:

```
System.getenv("VCAP_SERVICES");
```

For more information, see [TAS for VMs Environment Variables](#).

## Cloud Foundry Java Client Library

You can use the Cloud Foundry Java Client Library to manage an account on a Cloud Foundry instance.

Cloud Foundry Java Client Library v1.1.x works with apps using Spring v4.x, and Cloud Foundry Java Client Library v1.0.x work with apps using Spring v3.x. Both versions are available in the [Cloud Foundry Java Client Library](#) repository on GitHub.

## Adding the Java Client Library

To obtain the correct components, see the [Cloud Foundry Java Client Library](#) repository on GitHub.

Most projects need two dependencies: the Operations API and an implementation of the Client API. For more information about how to add the Cloud Foundry Java Client Library as dependencies to a Maven or Gradle project, see the sections below.

## Maven

Add the `cloudfoundry-client-reactor` dependency (formerly known as `cloudfoundry-client-spring`) to your `pom.xml` as follows:

```
<dependencies>
    <dependency>
        <groupId>org.cloudfoundry</groupId>
        <artifactId>cloudfoundry-client-reactor</artifactId>
        <version>2.0.0.BUILD-SNAPSHOT</version>
    </dependency>
    <dependency>
        <groupId>org.cloudfoundry</groupId>
        <artifactId>cloudfoundry-operations</artifactId>
        <version>2.0.0.BUILD-SNAPSHOT</version>
    </dependency>
    <dependency>
        <groupId>io.projectreactor</groupId>
        <artifactId>reactor-core</artifactId>
        <version>2.5.0.BUILD-SNAPSHOT</version>
    </dependency>
    <dependency>
        <groupId>io.projectreactor</groupId>
        <artifactId>reactor-netty</artifactId>
        <version>2.5.0.BUILD-SNAPSHOT</version>
    </dependency>
    ...
</dependencies>
```

The artifacts can be found in the Spring release and snapshot repositories:

```
<repositories>
    <repository>
        <id>spring-releases</id>
        <name>Spring Releases</name>
        <url>http://repo.spring.io/release</url>
    </repository>
    ...
</repositories>
```

```
<repositories>
    <repository>
        <id>spring-snapshots</id>
        <name>Spring Snapshots</name>
        <url>http://repo.spring.io/snapshot</url>
        <snapshots>
            <enabled>true</enabled>
        </snapshots>
    </repository>
</repositories>
```

```
...
</repositories>
```

## Gradle

Add the `cloudfoundry-client-reactor` dependency to your `build.gradle` file as follows:

```
dependencies {
    compile 'org.cloudfoundry:cloudfoundry-client-reactor:2.0.0.BUILD-SNAPSHOT'
    compile 'org.cloudfoundry:cloudfoundry-operations:2.0.0.BUILD-SNAPSHOT'
    compile 'io.projectreactor:reactor-core:2.5.0.BUILD-SNAPSHOT'
    compile 'io.projectreactor:reactor-netty:2.5.0.BUILD-SNAPSHOT'
    ...
}
```

The artifacts can be found in the Spring release and snapshot repositories:

```
repositories {
    maven { url 'http://repo.spring.io/release' }
    ...
}
```

```
repositories {
    maven { url 'http://repo.spring.io/snapshot' }
    ...
}
```

## Sample code

The following is a very simple sample app that connects to a Cloud Foundry instance, logs in, and displays some information about the Cloud Foundry account. When running the program, provide the Cloud Foundry target API endpoint, along with a valid user name and password as command-line parameters.

```
import org.cloudfoundry.client.lib.CloudCredentials;
import org.cloudfoundry.client.lib.CloudFoundryClient;
import org.cloudfoundry.client.lib.domain.CloudApplication;
import org.cloudfoundry.client.lib.domain.CloudService;
import org.cloudfoundry.client.lib.domain.CloudSpace;

import java.net.MalformedURLException;
import java.net.URI;
import java.net.URL;

public final class JavaSample {

    public static void main(String[] args) {
        String target = args[0];
        String user = args[1];
        String password = args[2];

        CloudCredentials credentials = new CloudCredentials(user, password);
        CloudFoundryClient client = new CloudFoundryClient(credentials, getTargetURL(target));
        client.login();
```

```

        System.out.printf("%nSpaces:%n");
        for (CloudSpace space : client.getSpaces()) {
            System.out.printf("  %s\t(%s)%n", space.getName(), space.getOrganization()
() .getName());
        }

        System.out.printf("%nApplications:%n");
        for (CloudApplication application : client.getApplications()) {
            System.out.printf("  %s%n", application.getName());
        }

        System.out.printf("%nServices%n");
        for (CloudService service : client.getServices()) {
            System.out.printf("  %s\t(%s)%n", service.getName(), service.getLabel());
        }
    }

    private static URL getTargetURL(String target) {
        try {
            return URI.create(target).toURL();
        } catch (MalformedURLException e) {
            throw new RuntimeException("The target URL is not valid: " + e.getMessage
());
        }
    }
}

```

For more details about the Cloud Foundry Java Client Library, see the [Cloud Foundry Java Client Library](#) repository on GitHub.

To view the objects that you can query and inspect, see [domain package](#) in the [cloudfoundry/cf-java-client](#) repository on GitHub.

## Using Java Native Image buildpack

You can build your Java apps with native image support and deploy those apps to Cloud Foundry.

A growing number of Java users are building Java apps using support for native images. For more information, see [Native Image](#) in the GraalVM documentation.

Java users deploying to Cloud Foundry can deploy apps compiled using native image support. However, the Cloud Foundry Java buildpack does not provide support to build, compile, and turn apps into a native image. You must perform those steps before deploying to Cloud Foundry.

To build an app to run on Cloud Foundry, use native build tools as described below.

## Building using Native Build Tools

This section describes how to deploy a Java app with native image support using Native Build Tools. If you do not want to build using Cloud Native Buildpacks, you can build and compile directly using the Native Build Tools.

To build a Java app using Native Build Tools:

1. Obtain an Ubuntu Bionic computer, VM, or container. Ubuntu Bionic is recommended for best compatibility with the Cloud Foundry `cflinuxfs3` root filesystem. Ubuntu 22.04 LTS (Jammy Jellyfish) is recommended for use with `cflinuxfs4`.
2. Install GraalVM. See [Get Started with GraalVM](#).
3. Install the Java Native Image tools. See [Install Native Image](#).
4. To add the Native Build Tools to your Maven or Gradle project, follow the instructions in [Add the native build tools plugin](#) in the Spring documentation. This only needs to be done once.
5. Clone the example repository from GitHub:

```
git clone https://github.com/paketo-buildpacks/samples
cd samples/java/native-image/java-native-image-sample
```

6. Build the example image:

```
mvn -Pnative -DskipTests package
```

For more information about building with Native Build Tools, see [Getting started with native build tools](#) in the Spring documentation.

## Deploying with direct build

This section describes how to deploy a Java app with native image support using a direct build.

To deploy a Java app with native image support using the binary buildpack:

1. Zip the executable created by your build tool, either Maven or Gradle. For example, with Maven, `zip demo.zip target/demo`. Alternatively, you can copy the executable into a directory by itself. For example, with Maven, `mkdir -p ./out && cp target/demo ./out/`. This is the root for `cf push`.
2. Push the root ZIP file or directory you created in the previous step. If you use a directory instead of a ZIP archive, adjust the `-p` argument. This is important so that it only uploads the compiled binary, not your entire project. You can adjust other properties or use a `manifest.yml` file to deploy as well.

```
cf push -b binary_buildpack -p demo.zip -c ./target/demo native-image
```

## Spring Boot and Spring Native

Regardless of how you build your app, with Spring Boot v2.5 and Spring Native v0.10.1, there is a bug that causes `cf push` to fail. The problem is caused by conditional behavior in Spring Boot Actuator when run on TAS for VMs. It is fixed in Spring Native v0.10.2.

For more information, see the [spring-projects-experimental](#) repository on GitHub.

You can also work around this issue by adding the following hints above your `@SpringBootApp` annotation:

For example:

```

@NativeHint(trigger = ReactiveTAS for VMsActuatorAutoConfiguration.class, types = {
    @TypeHint(types = EndpointTAS for VMsExtension.class, access = AccessBits.ANNOTATION),
    @TypeHint(typeNames = "org.springframework.boot.actuate.autoconfigure.TAS for VMs.TAS for VMsEndpointFilter"),
    @TypeHint(typeNames = "org.springframework.boot.actuate.autoconfigure.TAS for VMs.reactive.TAS for VMsWebFluxEndpointHandlerMapping$TAS for VMsLinksHandler", access = AccessBits.LOAD_AND_CONSTRUCT
        | AccessBits.DECLARED_METHODS) })
@NativeHint(trigger = TAS for VMsActuatorAutoConfiguration.class, types = {
    @TypeHint(types = EndpointTAS for VMsExtension.class, access = AccessBits.ANNOTATION),
    @TypeHint(typeNames = "org.springframework.boot.actuate.autoconfigure.TAS for VMs.TAS for VMsEndpointFilter"),
    @TypeHint(typeNames = "org.springframework.boot.actuate.autoconfigure.TAS for VMs.servlet.TAS for VMsWebEndpointServletHandlerMapping$TAS for VMsLinksHandler", access = AccessBits.LOAD_AND_CONSTRUCT
        | AccessBits.DECLARED_METHODS) })
@SpringBootapp
public class Demoapp {

    public static void main(String[] args) {
        Springapp.run(Demoapp.class, args);
    }

}

```

## Configuring service connections

The path for configuring service access in your Java based applications is the [java-cfenv](#) library. This library can read and parse `VCAP_SERVICES` and help you extract the information for use in your application.

There are a number of ways to implement this and all Java applications can use the library; it is not limited to specific frameworks. To get started, you must first add a dependency in your project for the library.

## Dependencies

The following examples show the dependency syntax for Maven and Gradle.

For Maven:

```

<dependency>
    <groupId>io.pivotal.cfenv</groupId>
    <artifactId>java-cfenv</artifactId>
    <version>2.4.0</version>
</dependency>

```

For Gradle:

```
implementation "io.pivotal.cfenv:java-cfenv:2.4.0"
```

## Java-only / No framework

The entry point for the library is the class `CfEnv`, which parses Cloud Foundry environment variables. For example, `VCAP_SERVICES`. `VCAP_SERVICES` which contains a JSON string that includes credential information used to access bound services, for example, databases.

Create a `CfEnv` instance and use its `findCredentialsBy*` methods. There are methods for finding by label, name, and tag. Multiple strings can be passed to match against more than one tag, and the finder method supports passing a regex string for pattern matching.

For example:

```
CfEnv cfEnv = new CfEnv();

String redisHost = cfEnv.findCredentialsByTag("redis").getHost();
String redisPort = cfEnv.findCredentialsByTag("redis").getPort();
String redisPassword = cfEnv.findCredentialsByTag("redis").getPassword();

List<CfService> cfService = cfEnv.findAllServices();

CfService redisService = cfEnv.findServiceByTag("redis");
List<String> redisServiceTags = redisService.getTags();
String redisPlan = redisService.getPlan();
redisPlan = redisService.get("plan");

CfCredentials redisCredentials = cfEnv.findCredentialsByTag("redis");
String redisPort = redisCredentials.getPort();
Integer redisPort = redisCredentials.getMap().get("port");

cfService = cfEnv.findServiceByName("redis");
cfService = cfEnv.findServiceByLabel("p-redis");
cfService = cfEnv.findServiceByLabel(".*-redis");
```

## JDBC support

There is additional support for getting a JDBC URL from a service binding. This support is contained in the module `java-cfenv-jdbc`. To enable this module, add the appropriate dependency.

For Maven:

```
<dependency>
  <groupId>io.pivotal.cfenv</groupId>
  <artifactId>java-cfenv-jdbc</artifactId>
  <version>2.4.0</version>
</dependency>
```

For Gradle:

```
implementation "io.pivotal.cfenv:java-cfenv-jdbc:2.4.0"
```

The entry point for this feature is the class `CfJdbcEnv`, which is a subclass of `CfEnv` and adds a few methods. The method `findJdbcService` heuristically looks at all services for known tags, labels, and names of common database services to create the URL.

For example:

```
CfJdbcEnv cfJdbcEnv = new CfJdbcEnv();
CfJdbcService cfJdbcService = cfJdbcEnv.findJdbcService();

String jdbcUrl = cfJdbcService.getJdbcUrl();
String username = cfJdbcService.getUsername();
String password = cfJdbcService.getPassword();
String driverClassName = cfJdbcService.getDriverClassName();
```

## Spring Framework

The Spring Framework provides additional support for application developers.

### Spring Expression Language

If you register the `CfJdbcEnv` class as a bean, then you can use the Spring Expression Language to set properties.

```
@Bean
public CfEnv cfEnv() {
    return new CfEnv();
}
```

Then, in the properties file imported by Spring, refer to the `CfEnv` bean using the following syntax:

```
cassandra.contact-points=#{ cfEnv.findCredentialsByTag('cassandra').get('node_ips') }
cassandra.username=#{ cfEnv.findCredentialsByTag('cassandra').getUserName() }
cassandra.password=#{ cfEnv.findCredentialsByTag('cassandra').getPassword() }
cassandra.port=#{ cfEnv.findCredentialsByTag('cassandra').get('cqlsh_port') }
```

To specifically target JDBC databases, register this instead:

```
@Bean
public CfJdbcEnv cfJdbcEnv() {
    return new CfJdbcEnv();
}
```

Then in a property file imported by Spring, refer to the `CfJdbcEnv` bean using the following syntax:

```
myDatasourceUrl=#{ cfJdbcEnv.findJdbcService().getUrl() }
```

## Spring Boot

The module `java-cfenv-boot` provides several `EnvironmentPostProcessor` implementations that set well-known Spring Boot properties so that Spring Boot's auto-configuration is active. For example, the `CfDataSourceEnvironmentPostProcessor` sets the Spring Boot property, `spring.datasource.url`.

To use these, add a dependency on `java-cfenv-boot`.

For Maven:

```
<dependency>
<groupId>io.pivotal.cfenv</groupId>
```

```
<artifactId>java-cfenv-boot</artifactId>
<version>2.4.0</version>
</dependency>
```

For Gradle:

```
implementation "io.pivotal.cfenv:java-cfenv-boot:2.4.0"
```

The list of supported services are:

- Databases - DB2, MySQL, Oracle, PostgreSQL, SQL Server
- RabbitMQ
- Cassandra
- MongoDB
- Redis
- CredHub
- HashiCorp Vault

If you need to prevent processing of a specific service instance, set the flag in your application properties to:

```
cfenv.service.{serviceName}.enabled=false
```

## Migrating from Spring AutoReconfiguration and Spring Cloud Connectors

The `java-cfenv` library replaces the older Spring AutoReconfiguration and Spring Cloud Connectors libraries. Use the information in the following sections to migrate to `java-cfenv`.

### Change dependencies

Remove references to any of these libraries from the application build files.

```
org.springframework.boot:spring-boot-starter-cloud-connectors
```

or

```
org.springframework.cloud:spring-cloud-core
org.springframework.cloud:spring-cloud-connectors-core
org.springframework.cloud:spring-cloud-cloudfoundry-connector
org.springframework.cloud:spring-cloud-spring-service-connector
```

Then add a reference to the `java-cfenv` library.

### Code changes

Remove any of the `@ServiceScan` or `@CloudScan` annotations from Spring Java configuration classes (provided by Spring Cloud Connectors). Replace them with the `Spring SPEL` or `Spring Boot configuration options` listed above.

## Migration considerations

Review these additional considerations before you migrate.

- **Non-Spring Boot applications:**

If you have a Spring Application that is a non-Spring Boot application, you can still migrate to `java-cfenv`. You must use either the [no framework options](#) or the [Spring SPeL option](#). With SPeL, you might need to manually process the expressions, depending on where you are configuring them. See the Spring documentation for places where SPeL expressions are processed by default.

- **Multiple service instances:**

Spring Cloud Connectors support connections to multiple service instances.

If you need to configure connections to multiple instances of a given service type, or do anything more than setting application properties for Spring Boot to pick up and use in auto-configuration, then you must follow the manual configuration approaches laid out in the sections above to access the binding credentials. Either [with direct Java code](#) or with [SPEL](#). Then follow the same procedure that is used to connect to the services in any other non-Cloud Foundry deployment environment.

- **Code modifications:**

The Java Buildpack injects the Spring Auto Reconfiguration module code into your application and overwrites your service configuration. This works well in some cases, but sometimes it causes problems.

With `java-cfenv`, there is no auto-reconfiguration magic. You can explicitly configure your services or you can use the [Spring Boot mappers](#). The [Spring Boot mappers](#) are the option most similar to previous operation. Note, that when things don't work, it's generally clearer what happened, and it's easier to debug the problem.

- **Cloud property placeholders:**

The Spring Auto Reconfiguration module exposes a set of property placeholder values that you can use to access values from `VCAP_SERVICES`. If you are using these placeholders, then you must switch from using `cloud.<property>`. Use `vcap.<property>` instead.

Spring Boot exposes the same information, just under the `vcap.` prefix instead of the `cloud.` prefix.

- **Spring Cloud Profile:**

The Spring Auto Reconfiguration module enables a Spring Profile called `cloud`, by default. Users have come to expect this behavior when deploying to Cloud Foundry. Without the Spring Auto

Reconfiguration module, you do not get this behavior. Fortunately, you can enable it using one of these methods:

- Run `cf set-env <APP> SPRING_PROFILES_ACTIVE cloud`
- Add `SPRING_PROFILES_ACTIVE: cloud` to the `env:` block in your `manifest.yml` file. This supplies the list of profiles for Spring to use.

If you need to set additional profiles, you can use `SPRING_PROFILES_INCLUDE` instead. This appends to the existing set of profiles.

- **Spring Cloud Connector extensions:**

If you have created any custom Spring Cloud Connector extensions, you must migrate them to `java-cfenv`. This requires two steps:

1. Write a [Spring Boot Auto Configuration](#) library that creates connections to your service from Spring configuration properties. This makes it easy to also use it in a non-cloud Spring Boot app. When this is done correctly, you can use the library, and set properties in `application.properties` (or through other means), and you can have a connection to your service.
2. Write a [java-cfenv extension](#). This takes values from `VCAP_SERVICES` and maps them to the properties that you exposed with your Spring Boot Auto Configuration library from the previous step.

## Java Buildpack warnings

The Java Buildpack generates warnings to help with migrating from Spring Cloud Connectors and Spring Auto Reconfiguration.

- **Spring Auto Reconfiguration installed:**

This is the message that is generated when the buildpack installs the Spring Auto Reconfiguration JAR. This happens by default, and notifies you that it is happening.

```
[SpringAutoReconfiguration]      WARN  ATTENTION: The Spring Auto Reconfiguration and shaded Spring Cloud Connectors libraries are being installed. These projects have been deprecated, are no longer receiving updates, and should not be used going forward.
[SpringAutoReconfiguration]      WARN  If you are not using these libraries, set `JBP_CONFIG_SPRING_AUTO_RECONFIGURATION='{enabled: false}'` to their installation and clear this warning message. The buildpack switches the default to deactivate by default after Aug 2022. Spring Auto Reconfiguration and its shaded Spring Cloud Connectors are removed from the buildpack after Dec 2022.
[SpringAutoReconfiguration]      WARN  If you are using these libraries, please migrate to java-cfenv immediately. See https://via.vmw.com/EhzD for migration instructions
```

How you resolve this depends on whether you are depending on the Auto Reconfiguration to occur.

- If your application depends on Auto Reconfiguration behavior, then you must make code changes in your application to use the `java-cfenv` library. See the instructions above for how to include the dependencies and how to access service information using this library.

After you have added `java-cfenv` to your classpath, the Java buildpack no longer installs the Auto Reconfiguration JAR and you no longer see this message.

- If your application is not depending on Auto Reconfiguration behavior, and has already been updated to `java-cfenv`, then this message is not generated. If your application does not use Auto Reconfiguration or `java-cfenv`, then you can either:
  - Run `cf set-env <APP> JBP_CONFIG_SPRING_AUTO_RECONFIGURATION '{enabled: false}'`
  - Add `JBP_CONFIG_SPRING_AUTO_RECONFIGURATION: '{enabled: false}'` to the `env:` block in your `manifest.yml` file.

Alternatively, you can use a buildpack released after Aug 2022, after which this feature is no longer enabled by default.

- **Spring Cloud Connectors present:**

The following message is generated when the buildpack detects that the Spring Cloud Connectors library is present on the classpath.

```
[SpringAutoReconfiguration]      WARN  ATTENTION: The Spring Cloud Connectors library is present in your application. This library has been in maintenance mode since July 2019 and stops receiving all updates after Dec 2022.
[SpringAutoReconfiguration]      WARN  Please migrate to java-cfenv immediately. See https://via.vmw.com/EhzD for migration instructions.
```

When this message appears, it means that your application or one of its dependencies is including the Spring Cloud Connectors library. You must remove it and migrate to `java-cfenv`.

After you have migrated to `java-cfenv`, and the Spring Cloud Connectors libraries are no longer on your classpath, this error no longer appears. There is no way to manually suppress this message.

## .NET Core buildpack

You can push Cloud Foundry apps to Linux Diego Cells using the .NET Core buildpack. To find supported ASP.NET Core versions, see [.NET Core buildpack release notes](#).

The .NET Core buildpack can only be used to deploy apps to Linux Diego Cells.

To deploy .NET Core apps to Windows Diego Cells, use the Binary buildpack. For more information about the Binary buildpack, see [Binary Buildpack](#).

Buildpacks provide needed dependencies to Cloud Foundry apps. Cloud Foundry automatically uses the .NET Core buildpack when one or more of the following conditions are met:

- The pushed app contains one or more `*.csproj` or `*.fsproj` files.
- The app is pushed from the output directory of the `dotnet publish` command.

For information about deploying different types of .NET apps, follow the links in the following table:

Type of .NET App	Buildpack
ASP.NET MVC	HWC
ASP.NET Web Forms	
ASP.NET WebAPI Apps	
Windows Communication Foundation (WCF)	
.NET Console	Binary
.NET Core pushed to Windows stack	Binary

## Push a .NET Core app

To push a .NET Core app to a Linux Diego Cell:

1. Run:

```
cf push APP-NAME
```

Where `APP-NAME` is the name you want to give your app.

If your Cloud Foundry deployment does not have the .NET Core buildpack installed or the installed version is out of date, run the same command with the `-b` option to specify the buildpack:

```
cf push APP-NAME -b https://github.com/cloudfoundry/dotnet-core-buildpack.git
```

Where `APP-NAME` is the name you want to give your app.

2. Find the URL of your app in the output of the `cf push` command.
3. Open a browser and navigate to the URL to see your app running.

For a basic sample app, see [ASP.NET Core Getting Started App](#) in GitHub.

## Source-based, non-published deployments

For a source-based, non-published deployment, you push your app's source code, not the output directory of the `dotnet publish` command.

The source-based, non-published workflow ensures the buildpack can keep all your dependencies in sync and up to date. See the following sections.

The source-based deployment workflow also uses the `cf push` command to push source-based apps to Cloud Foundry.

## Deploying apps with multiple projects

If you are deploying an app containing multiple projects, you must specify which of the app's projects is the main project.

To specify the main project in a multi-project deployment:

1. Create a `.deployment` file in your app's root folder and open the new file in a text editor.
2. Designate the main project's path by configuring the file, using the following format:

```
[config]
project = PATH-TO-YOUR-MAIN-PROJECT
```

Where `PATH-TO-YOUR-MAIN-PROJECT` is the location of your main project's `*.csproj` or `*.fsproj` file.

For example:

```
[config]
project = src/MyApp.Web/MyApp.Web.csproj
```

In this example, by pointing to the `MyApp.Web *.csproj` file, `MyApp.Web` is configured as the main project.

### 3. Save the revised `.deployment` file.

When deployed, the buildpack attempts to run the main project using the `dotnet run` command, `dotnet run -p PATH-TO-YOUR-MAIN-PROJECT`, and automatically compiles all projects listed as dependencies in the main project's `*.csproj` or `*.fsproj` file.

For example: Suppose your `.deployment` file is configured as previously noted and you have an app `src` folder containing three projects: `MyApp.Web`, `MyApp.DAL` and `MyApp.Services`. If your `MyApp.Web.csproj` file lists the `MyApp.DAL` and `MyApp.Services` projects as dependencies, the two additional projects are compiled by the buildpack.

## Use non-Default package sources

If you want to deploy an app that uses non-default package sources, you must specify those package sources in the `NuGet.Config` file. For information about `NuGet.Config`, see [nuget.config reference](#) in the Microsoft documentation.

## Deactivating and clearing your NuGet package cache

You might need to deactivate NuGet package caching or clear NuGet packages cached in the staging environment in one of the following scenarios:

- Your app fails to stage because it runs out of space, exceeding the maximum allowable disk quota.
- You have added pre-release packages to test a new feature and then decided to revert back to the main NuGet feed. You might need to remove the packages you changed from the cache to avoid conflicts.

Deactivating NuGet caching clears any existing NuGet dependencies from the staging cache and prevents the buildpack from adding NuGet dependencies to the staging cache.

NuGet package caching is deactivated by default. If the default is not explicitly overridden, no additional NuGet caching configuration is required.

To deactivate NuGet package caching:

1. Confirm the `CACHE_NUGET_PACKAGES` environment variable is not set to `true` in your app manifest by locating the `manifest.yml` file and confirming `CACHE_NUGET_PACKAGES` is not set to `true`.
2. If needed, set `CACHE_NUGET_PACKAGES` to `false` in the `manifest.yml` file by setting the `CACHE_NUGET_PACKAGES` environment variable to `false`.

For example:

```
---
applications:
- name: sample-aspnetcore-app
  memory: 512M
  env:
    CACHE_NUGET_PACKAGES: false
```

- To alternatively configure the setting to `false` in the environment variables settings, run the following command:

```
cf set-env APP-NAME CACHE_NUGET_PACKAGES false
```

Where `APP-NAME` is the name of your app.

For more information, see [Environment Variables](#) in *Deploying with App Manifests*.

## Framework dependent deployments

For a framework-dependent deployment (FDD), you deploy only your app and third-party dependencies. VMware recommends using this workflow if you deploy an app in an offline setting.

For information about deploying FDDs, see [Framework-dependent deployments \(FDD\)](#) in the Microsoft documentation.

Deploy a FDD using the buildpack:

- Publish the app by running:

```
dotnet publish [-f FRAMEWORK-NAME] [-c Release]
```

Where `FRAMEWORK-NAME` is your target framework.

- Prepare to push your app with one of these methods:
  - If your app uses a `manifest.yml`, specify a path to the output folder of `dotnet publish`. This allows you to push your app from any directory.
  - If not, go to `bin/Debug|Release/FRAMEWORK-NAME/RUNTIME-NAME/publish` directory, where `FRAMEWORK-NAME` is your target framework, and `RUNTIME-NAME` is the runtime you are using to push your app.
- Push your app.

## Self contained deployments

For a self-contained deployment (SCD), you deploy your app, third-party dependencies, and the version of .NET Core that you used to build your app.

For information about SCDs, see [Self-contained deployments \(SCD\)](#) in the Microsoft documentation.

Note that VMware does not recommend using the SCD workflow. The buildpack is unable to keep dependencies in sync and up to date for workflows that deploy a pre-published binary.

When using the SCD workflow for deploying your app, you must:

- Specify a runtime in the `dotnet publish` command. For example:

```
dotnet publish -r ubuntu14.04-x64
```

- Include the specified runtime in the `RuntimeIdentifiers` section of the project file.

## Specify .NET Core SDKs

To pin the .NET Core SDK to a specific version or version line, create a `buildpack.yml` file at the app root and add your SDK version in one of the following formats:

```
dotnet-core:
  sdk: 2.1.201
```

```
dotnet-core:
  sdk: 2.1.x
```

```
dotnet-core:
  sdk: 2.x
```

The buildpack chooses what SDK to install based on the files present at the app root in the following order of precedence:

- `buildpack.yml`
- `global.json`
- `*.fsproj`

The app respects the SDK version specified in `global.json` at runtime. If you provide versions in both `global.json` and `buildpack.yml` files, make sure you specify the same versions in both files.

## Specify .NET Runtime versions

This section explains how to specify a .NET Runtime version for source-based and framework-dependent apps.

### Source-based apps

If you want to lock the .NET Runtime version, configure your `.csproj` or `.fsproj` file to lock your app to the desired version.

For example, the following configuration locks the runtime to 2.1:

```
<PropertyGroup>
  <TargetFramework>netcoreapp2.1</TargetFramework>
  <RuntimeFrameworkVersion>2.1.*</RuntimeFrameworkVersion>
</PropertyGroup>
```

For source-based apps, specify a minor version of the .NET Runtime. Do not specify a patch version, because buildpacks contain only the two most recent patch versions of each minor version.

## Framework-dependent apps

Your app is configured to use the latest .NET Runtime patch version by default.

If you want your app to maintain a specific .NET Runtime version, you must modify your app's `.runtimeconfig.json` file to include the `applyPatches` property and set the property to `false`.

For example:

```
{
  "runtimeOptions": {
    "tfm": "netcoreapp2.0",
    "framework": {
      "name": "Microsoft.NETCore.App",
      "version": "2.0.0"
    },
    "applyPatches": false
  }
}
```

Set `applyPatches: false` in `*.runtimeconfig.json` only if you want to pin your .NET Framework to a specific version. This prevents your app from receiving updates to the runtime version and assemblies.

## Push an app in a disconnected environment

For offline environments, VMware recommends using the Framework-Dependent Deployment workflow. This workflow enables the deployed app to use the latest runtime provided by the offline buildpack. For more information, see [Framework-Dependent Deployments](#) above.

## Maintain ASP.NET Core assemblies

This section applies only to source-based and framework-dependent deployments.

For maintaining ASP.NET Core assemblies, VMware recommends one of these methods:

- Configure your app as a fully vendored app requiring fewer buildpack updates. Add the following to your `.csproj` file:

```
<PropertyGroup>
  <PublishWithAspNetCoreTargetManifest>false</PublishWithAspNetCoreTargetManife
st>
</PropertyGroup>
```

- Keep your SDK up to date, by setting `buildpack.yml` to the .NET SDK line you want to use. For example:

```
---
dotnet-core:
  sdk: 2.0.x
```

`2.0.x` ASP.NET Core assemblies are released in the `2.1.200-2.1.299` SDK versions, and `2.1.x` assemblies are released in the `2.1.300` and higher SDK versions.

## Configuring the listen port

Cloud Foundry sets the `$PORT` environment variable automatically. For your .NET Core app to work on Cloud Foundry, you must configure the app to listen on the environment's specified port.

For C# apps, the following modifications activate the buildpack to pass the correct port from `$PORT` environment variable to the app when you run the initial startup command:

1. Open the file that contains your `Main` method.

2. Add a `using` statement to the top of the file:

```
using Microsoft.Extensions.Configuration;
```

3. Add the following lines before the line `var host = new WebHostBuilder()`:

```
var config = new ConfigurationBuilder()
    .AddCommandLine(args)
    .Build();
```

4. Add the following line after `.UseKestrel()`:

```
.UseConfiguration(config)
```

The `Main` method resembles the following example:

```
public static void Main(string[] args)
{
    var config = new ConfigurationBuilder()
        .AddCommandLine(args)
        .Build();
    var host = new WebHostBuilder()
        .UseKestrel()
        .UseConfiguration(config)
        .UseContentRoot(Directory.GetCurrentDirectory())
        .UseStartup<Startup>()
        .Build();
    host.Run();
}
```

5. Save your changes.

6. Add `Microsoft.Extensions.Configuration.CommandLine` as a dependency in `*.csproj`:

```
<PackageReference Include="Microsoft.Extensions.Configuration.CommandLine">
    <Version>VERSION</Version>
</PackageReference>
```

Where `VERSION` is the version of the package to use. For a list of valid versions, navigate to <https://www.nuget.org>.

7. If your app requires any other files at runtime, such as JSON configuration files, add them to the `include` section of `copyToOutput`.
8. Save your changes.

With these changes, the `dotnet run` command copies your app `Views` to the build output where the .NET CLI can find them.

## Add custom libraries

If your app requires external shared libraries that are not provided by the rootfs or the buildpack, you must place the libraries in an `ld_library_path` directory at the app root.

You must keep these libraries up to date. They do not update automatically.

The .NET Core buildpack adds the directory `APP-ROOT/ld_library_path` to `LD_LIBRARY_PATH`, where `APP-ROOT` is the app root, so your app can access these libraries at runtime.

## Known issue workaround: NTLM authentication failures on cflinuxfs4

There is a [known issue](#) in .NET Core related to NTLM authentication on Ubuntu 22.04, which can affect builds using the .NET Core buildpack on the Ubuntu 22.04-based `cflinuxfs4` stack. The issue is related to incompatibilities between OpenSSL 3.0 and the older cryptographic algorithms involved in NTLM authentication.

In general, the best practice and recommended option is to upgrade to an authentication protocol in the application that does not rely on using widely-discouraged legacy cryptographic algorithms.

If you are affected by this issue, you might see failures with your .NET Core application running on the `cflinuxfs4` stack related to GSSAPI/NTLM, such as:

```
GSSAPI operation failed with error - Unspecified GSS failure. Minor code may provide more information (Crypto routine failure).
```

If you cannot upgrade to a different authentication protocol, the only workaround in the buildpack at this time is to load and activate the legacy provider in OpenSSL 3.



Use of the legacy provider is not considered secure, because it enables deprecated or outdated algorithms. You should be aware of the risk involved in leveraging this workaround.

To enable the workaround:

1. Ensure that the .NET Core buildpack version is v2.4.24 or later
2. Set the `BP_OPENSSL_ACTIVATE_LEGACY_PROVIDER` environment variable to `true` in the `manifest.yml` or using `cf set-env`
3. Push the application

These steps add an `openssl.cnf` file to your application directory during the build. This file contains the following lines, which load and activate the legacy SSL provider in OpenSSL 3 on the base image:

```
[provider_sect]
default = default_sect
legacy = legacy_sect
```

```
[default_sect]
activate = 1

[legacy_sect]
activate = 1
```

## NGINX buildpack

You can push your NGINX app to Cloud Foundry and configure your NGINX app to use the NGINX buildpack.

### Push an app

If your app contains an `nginx.conf` file, Cloud Foundry automatically uses the NGINX buildpack when you run `cf push` to deploy your app.

If your Cloud Foundry deployment does not have the NGINX buildpack installed or the installed version is outdated, deploy your app with the current buildpack by running:

```
cf push YOUR-APP -b https://github.com/cloudfoundry/nginx-buildpack.git
```

Where `YOUR-APP` is the name of your app.

For example:

```
$ cf push my-app -b https://github.com/cloudfoundry/nginx-buildpack.git
```

## Configure NGINX

VMware recommends that you use the default NGINX directory structure for your NGINX web server. You can view this directory structure in the [nginx-buildpack](#) repository in GitHub.

Configure the NGINX web server. You need these elements.

- A root directory for all static web content
- A MIME type configuration file
- An NGINX configuration file
- A `buildpack.yml` YAML file that defines the version of NGINX to use. For example, see [buildpack.yml](#) Buildpack repository in GitHub.

Make any custom configuration changes based on these default files to verify compatibility with the buildpack.

### Create the `nginx.conf` file

Use the templating syntax when you create an `nginx.conf` file. This templating syntax loads modules and binds to ports based on values known at start time.

#### Port

Use `{{port}}` to set the port on which to listen. At start time, `{{port}}` interpolates in the value of `$PORT`.

You must use `{{port}}` in your `nginx.conf` file.

For example, to set an NGINX server to listen on `$PORT`, include the following in your `nginx.conf` file:

```
server {
  listen {{port}};
}
```

## Name resolution

The NGINX buildpack does not resolve internal routes by default. To resolve internal routes, use `{{nameservers}}` to set the resolver IP address. At start time, `{{nameservers}}` interpolates the address of a platform-provided DNS service that includes information about internal routes.

Connections to internal routes do not go through the Cloud Foundry routing tier. As a result, you might see errors if you proxy an app on an internal route while it is restarting. There are some workarounds you might need to consider.

For more information, see [Using DNS for Service Discovery with NGINX and NGINX Plus](#) on the NGINX blog.

## Environment variables

To use an environment variable, include `{}{{env "YOUR-VARIABLE"}}`, where `YOUR-VARIABLE` is the name of an environment variable. At staging and at startup, the current value of the environment variable is retrieved.

For example, include the following in your `nginx.conf` file to activate or deactivate GZipping based on the value of `GZIP_DOWNLOADS`:

```
gzip {{env "GZIP_DOWNLOADS" }};
```

- If you set `GZIP_DOWNLOADS` to `off`, NGINX does not GZip files.
- If you set `GZIP_DOWNLOADS` to `on`, NGINX GZips files.

## Unescaped environment variables

To use unescaped environment variables, add an array of environment variable names to the `buildpack.yml`. See the following example:

```
---
nginx:
  version: stable
  plaintext_env_vars:
    - "OVERRIDE"
```

In this example, the `OVERRIDE` environment variable can contain `.json` content without being `html` escaped. You must properly quote such variables to appear as strings in the `nginx.conf` file.

## Loading dynamic modules

NGINX can dynamically load modules at runtime. These modules are shared-object files that can be dynamically loaded using the `load_module` directive. In addition to loading modules dynamically, the NGINX version provided by the buildpack has statically compiled the following modules into the NGINX binary:

- `ngx_http_ssl_module`
- `ngx_http_realip_module`
- `ngx_http_gunzip_module`
- `ngx_http_gzip_static_module`
- `ngx_http_auth_request_module`
- `ngx_http_random_index_module`
- `ngx_http_secure_link_module`
- `ngx_http_stub_status_module`
- `ngx_http_sub_module`

These statically compiled modules do not need to be loaded at runtime and are already available for use.

To load a dynamic NGINX module, use the following syntax in the app `nginx.conf` file for your app:

```
{ {module "MODULE-NAME"}}
```

If you have provided a module in a `modules` directory located at the root of your app, the buildpack instructs NGINX to load that module. If you have not provided a module, the buildpack instructs NGINX to search for a matching built in dynamic module.

As of v0.0.5 of the buildpack, the `ngx_stream_module` is available as a dynamic module that is built into the buildpack.

For example, to load a custom module named `ngx_hello_module`, provide a `modules/ngx_hello_module.so` file in your app directory and add the line below to the top of your `nginx.conf` file:

```
{ {module "ngx_hello_module"}}
```

To load a built in module like `ngx_stream_module`, add the following line to the top of your `nginx.conf` file. You do not need to provide an `ngx_stream_module.so` file:

```
{ {module "ngx_stream_module"}}
```

To name your modules directory something other than `modules`, use the NGINX `load_module` directive, providing a path to the module relative to the location of your `nginx.conf` file. For example: `load_module some_module_dir/my_module.so`

## Enable logging

By default, logging is deactivated in the NGINX buildpack. This helps optimize performance.

If you configure NGINX to log to stdout or stderr, the logs are captured by the Cloud Foundry logging subsystem.

## Logging access

Use the `access_log` directive in the appropriate location in the `nginx.conf` to enable access logging. Use the following syntax:

```
access_log <file> [format]
```

Where:

- `file` is the name of the file where the log is to be stored. The special value `/dev/stdout` selects the standard output.
- `format` is the logging format to use. Refer to the NGINX documentation for valid customization options.

Example:

```
access_log /dev/stdout;
```

## Logging errors

Set the debug level with the `error_log` directive in the `nginx.conf` to enable debug logging. Add the `error_log` entry to your `nginx.conf` file using the syntax below:

```
error_log <file> [level];
```

Where:

- `file` is the name of the file where the log is to be stored. The special value `stderr` selects the standard error file. Logging to `syslog` can be configured by specifying the “`syslog:`” prefix.
- `level` specifies the level of logging, and can be one of the following:
  - `debug`
  - `info`
  - `notice`
  - `warn`
  - `error` (default)
  - `crit`
  - `alert`
  - `emerg`

The log levels above are listed in the order of increasing severity. Setting a certain log level causes all messages of the specified and more severe log levels to be logged. For example, the default level `error` causes `error`, `crit`, `alert`, and `emerg` messages to be logged. If this parameter is omitted, then `error` is used.

Example:

```
error_log stderr debug;
```

### Debug logs for selected clients

To enable the debugging log for selected client addresses only, use the syntax below.

```
error_log stderr;

events {
  debug_connection 192.168.1.1;
  debug_connection 192.168.10.0/24;
}
```

### Logging to a cyclic memory buffer

The debugging log can be written to a cyclic memory buffer. Use the syntax shown below.

```
error_log memory:32m debug;
```

Logging to the memory buffer on the debug level does not have significant impact on performance, even under high load. In this case, the log can be extracted using a gdb script like the one in the following example:

```
set $log = ngx_cycle->log

while $log->writer != ngx_log_memory_writer
  set $log = $log->next
end

set $buf = (ngx_log_memory_buf_t *) $log->wdata
dump binary memory debug_log.txt $buf->start $buf->end
```

## NGINX buildpack support

The resources listed in this section can assist you when using the NGINX buildpack or when developing your own NGINX buildpack.

- **NGINX Buildpack Repository in GitHub:** Find more information about using and extending the NGINX buildpack in the [NGINX buildpack](#) GitHub repository.
- **Release Notes:** Find current information about this buildpack on the [NGINX buildpack release page](#) in GitHub.
- **Slack:** Join the #buildpacks channel in the [Cloud Foundry Slack community](#).

## Node.js

In this section:

- [Node.js buildpack](#)

- Node.js buildpack specific information
- Environment variables defined by Node buildpack
- Configuring service connections for Node.js application

## Node.js buildpack

You can configure and use the Node.js buildpack in Cloud Foundry.

You can use the Node.js buildpack with Node or JavaScript apps. The follow sections describe how to push apps with the Node.js buildpack, along with features of the buildpack.

You must install the [Cloud Foundry Command Line Interface tool](#) (cf CLI) to run some of the commands listed in this topic.

## Push Node.js apps

Cloud Foundry automatically uses the Node.js buildpack if it detects a `package.json` file in the root directory of your project.

The `-b` option lets you specify a buildpack to use with the `cf push` command. If your Cloud Foundry deployment does not have the Node.js buildpack installed or the installed version is out of date, run the following command to push your app with the latest version of the buildpack:

```
cf push APP-NAME -b https://github.com/cloudfoundry/nodejs-buildpack
```

Where `APP-NAME` is the name of your app.

For example:

```
$ cf push my-nodejs-app -b https://github.com/cloudfoundry/nodejs-buildpack
```

For more detailed information about deploying Node.js apps, see the following topics:

- [Tips for Node.js Developers](#)
- [Environment Variables Defined by the Node Buildpack](#)
- [Configuring Service Connections for Node](#)
- [Node.js Buildpack Source Code on GitHub](#)

## Supported versions

For a list of supported Node versions, see the Node.js Buildpack [release notes](#) on GitHub.

## Specify a Node.js version

To specify a Node.js version, set the `engines.node` in the `package.json` file to the semantic versioning specification (semver) range or the specific version of Node you are using.

Example showing a semver range:

```
"engines": {
  "node": "6.9.x"
}
```

Example showing a specific version:

```
"engines": {
  "node": "6.9.0"
}
```

If you try to use a version that is not currently supported, staging your app fails with the following error message:

```
Could not get translated url, exited with: DEPENDENCY_MISSING_IN_MANIFEST:...
!
!     exit
!
Staging failed: Buildpack compilation step failed
```

## Specify an npm version

To specify an npm version, set `engines.npm` in the `package.json` file to the semantic versioning specification (semver) range or the specific version of npm you are using:

Example showing a semver range:

```
"engines": {
  "node": "6.9.x",
  "npm": "2.15.x"
}
```

Example showing a specific version:

```
"engines": {
  "node": "6.9.0",
  "npm": "2.15.1"
}
```

If you do not specify an npm version, your app uses the default npm packaged with the Node.js version used by your app, as specified on the [Node.js releases](#) page.

If your environment cannot connect to the Internet and you specified a non-supported version of npm, the buildpack fails to download npm and you see the following error message:

```
We're unable to download the version of npm you've provided (...).
Please remove the npm version specification in package.json (...)

Staging failed: Buildpack compilation step failed
```

## Using npm or Yarn

By default, the Node.js buildpack assumes you are using npm. If you want to use [Yarn](#) instead, you must provide a `yarn.lock` in your top-level app directory. For more information on the Yarn lock file, see

[yarn.lock](#) in the Yarn documentation.

## Vendorizing app dependencies

To vendor dependencies for an app using the Node.js buildpack, run `npm install` (or `yarn install`, if you are using Yarn) from your app directory. This command vendors dependencies into the `node_modules` directory of your app directory.

For example, the following example vendors dependencies into the `my-nodejs-app/node_modules` directory:

```
$ cd my-nodejs-app
$ npm install
```

The `cf push` command uploads the vendored dependencies with the app.

For an app to run in a disconnected environment, it must vendor its dependencies and provide a lock file.

## Use in offline environments

When vendoring apps for usage in offline environments, you must supply a lock file. For information on npm lockfiles, see [npm-package-locks](#) in the NPM documentation.

For information on `npm-package-lock.json` files, see [package-lock.json](#) in the NPM documentation.

This lock file informs the package manager of the exact versions of dependencies and transitive dependencies to look for when running `npm install` or `yarn install`. For this reason, you must keep `package.json`, the vendored `node_modules` directory, and your lock file synchronized to avoid network calls.



The `package-lock.json` file is only supported by NPM 5.x and later. For earlier versions of NPM, provide a `npm-shrinkwrap.json` file instead. Versions 1.5.28 and later of the Node.js buildpack include the ability to use Yarn in offline mode. To do so, you must mirror the Yarn registry locally by providing an `npm-packages-offline-cache` directory:

```
$ cd APP-DIR
$ yarn config set yarn-offline-mirror ./npm-packages-offline-cache
$ yarn config set yarn-offline-mirror-pruning true
$ cp ~/.yarnrc .
$ rm -rf node_modules/ yarn.lock # if they were previously generated
$ yarn install
```

When you push the app, the buildpack looks for an `npm-packages-offline-cache` directory at the top level of the app directory. If this directory exists, the buildpack runs Yarn in offline mode. Otherwise, it runs Yarn normally, which may require an Internet connection. You do not have to provide a `node_modules` directory when running Yarn in offline mode, as the offline cache provides the dependencies.

For more information about using an offline mirror with Yarn, see the [Yarn Blog](#).

## Integrity check

By default, the Node.js buildpack uses npm to download dependencies. Note, that npm does not perform integrity checks of the downloaded packages, which is a [security risk](#).

If missing dependencies are detected, the buildpack runs `npm install` for non-vendored dependencies or `npm rebuild` for dependencies that are already vendored. This might result in code being downloaded and run without verification.

You can use Yarn as an alternative that verifies dependencies.

## OpenSSL support

The [nodejs-buildpack](#) packages binaries of Node.js with OpenSSL that are statically linked. The Node.js buildpack supports Node.js 4.x and later, which relies on the Node.js release cycle to provide OpenSSL updates. The [binary-builder](#) enables [static OpenSSL compilation](#).

## Proxy support

If you need to use a proxy to download dependencies during staging, you can set the `http_proxy` and/or `https_proxy` environment variables. For more information, see [Using a Proxy](#).

## BOSH configured custom trusted certificate support

Node.js hardcodes root CA certs in its source code. To use [BOSH configured custom trusted certificates](#), a developer must pass the specified CAs to the `tls.connect` function as extra arguments.

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need any further assistance.

For more information about using and extending the Node.js buildpack in Cloud Foundry, see the [Node.js GitHub repository](#).

You can find current information about this buildpack in the Node.js buildpack [release page](#) in GitHub.

## Node.js buildpack-specific information

You can use node-specific information to supplement the general guidelines in the [Pushing an app](#) topic.

For information about using and extending the Node.js buildpack in Cloud Foundry, see the [nodejs-buildpack repository](#) in GitHub.

You can find current information about this buildpack on the Node.js buildpack [release page](#) in GitHub.

The buildpack uses a default Node.js version. To specify the versions of Node.js and npm an app requires, edit the app's `package.json`, as described in "node.js and npm versions" in the [nodejs-buildpack repository](#).

## Application package file

Cloud Foundry expects a `package.json` in your Node.js app. You can specify the version of Node.js you want to use in the `engine` node of your `package.json` file.

In general, Cloud Foundry supports the two most recent versions of Node.js. See the GitHub [Node.js buildpack](#) page for current information.

Example `package.json` file:

```
{
  "name": "first",
  "version": "0.0.1",
  "author": "Demo",
  "dependencies": {
    "express": "3.4.8",
    "consolidate": "0.10.0",
    "swig": "1.3.2"
  },
  "engines": {
    "node": "0.12.7",
    "npm": "2.7.4"
  }
}
```

## Application port

You must use the `PORT` environment variable to determine which port your app listens on. To also run your app locally, set the default port as `3000`.

```
app.listen(process.env.PORT || 3000);
```

## Low Memory environments

When running node apps, you might notice that instances are occasionally restarted due to memory constraints. Node does not know how much memory it is allowed to use, and thus sometimes allows the garbage collector to wait past the allowed amount of memory. To resolve this issue, set the `OPTIMIZE_MEMORY` environment variable to `true` (requires node v6.12.0 or greater). This sets `max_old_space_size` based on the available memory in the instance.

```
$ cf set-env my-app OPTIMIZE_MEMORY true
```

## Application start command

Node.js apps require a start command. You can specify the web start command for a Node.js app in a Procfile or in the app deployment manifest. For more information about Procfiles, see the [Configuring a Production Server](#) topic.

The first time you deploy, you are asked if you want to save your configuration. This saves a `manifest.yml` in your app with the settings you entered during the initial push. Edit the `manifest.yml` file and create a start command as follows:

```
---
applications:
- name: my-app
```

```
command: node my-app.js
... the rest of your settings ...
```

Alternately, specify the start command with `cf push -c`.

```
$ cf push my-app -c "node my-app.js"
```

## Application bundling

You do not need to run `npm install` before deploying your app. Cloud Foundry runs it for you when your app is pushed. You can, if you prefer, run `npm install` and create a `node_modules` folder inside of your app.

## Solve discovery problems

If Cloud Foundry does not automatically detect that your app is a Node.js app, you can override auto-detection by specifying the Node.js buildpack.

Add the buildpack into your `manifest.yml` and re-run `cf push` with your manifest:

```
---
applications:
- name: my-app
  buildpacks: https://github.com/cloudfoundry/nodejs-buildpack
... the rest of your settings ...
```

Alternately, specify the buildpack on the command line with `cf push -b`:

```
$ cf push my-app -b https://github.com/cloudfoundry/nodejs-buildpack
```

## Bind services

Refer to [Configure Service Connections for Node.js](#).

## Environment variables

You can access environments variable programmatically.

For example, you can obtain `VCAP_SERVICES` as follows:

```
process.env.VCAP_SERVICES
```

Environment variables available to you include both those [defined by the system](#) and those defined by the Node.js buildpack, as described below.

### BUILD\_DIR directory

Directory into which Node.js is copied each time a Node.js app is run.

### CACHE\_DIR directory

Directory that Node.js uses for caching.

## PATH

The system path used by Node.js.

```
PATH=/home/vcap/app/bin:/home/vcap/app/node_modules/.bin:/bin:/usr/bin
```

## Environment variables defined by the Node buildpack

Cloud Foundry provides configuration information to apps through environment variables. You can also use the additional environment variables provided by the Node buildpack.

For more information about the standard environment variables provided, see [TAS for VMs Environment Variables](#).

## Node buildpack environment Variables

The following table describes the environment variables provided by the Node buildpack:

Environment Variable	Description
BUILD_DIR	The directory where Node.js is copied each time a Node.js app runs.
CACHE_DIR	The directory Node.js uses for caching.
PATH	The system path used by Node.js: PATH=/home/vcap/app/bin:/home/vcap/app/node_modules/.bin:/bin:/usr/bin

## Configuring service connections for Node.js

You can bind a data source to a Node.js application that is deployed and running on Cloud Foundry.

## Parse VCAP\_SERVICES for credentials

You must parse the `VCAP_SERVICES` environment variable in your code to get the required connection details such as host address, port, user name, and password.

For example, if you are using PostgreSQL, your `VCAP_SERVICES` environment variable might look something like this:

```
{
  "mypostgres": [
    {
      "name": "myinstance",
      "credentials": {
        "uri": "postgres://myusername:mypassword@host.example.com:5432/serviceinstance"
      }
    }
  ]
}
```

This example JSON is simplified; yours might contain additional properties.

## Parse with cfenv

The `cfenv` package provides access to Cloud Foundry application environment settings by parsing all the relevant environment. The settings are returned as JavaScript objects. `cfenv` provides reasonable defaults when running locally, as well as when running as a Cloud Foundry application.

For more information, see the [npm website](#).

## Manual parsing

First, parse the `VCAP_SERVICES` environment variable.

For example:

```
var vcap_services = JSON.parse(process.env.VCAP_SERVICES)
```

Then pull out the credential information required to connect to your service. Each service packages requires different information. If you are working with Postgres, for example, you need a `uri` to connect. You can assign the value of the `uri` to a variable as follows:

```
var uri = vcap_services.mypostgres[0].credentials.uri
```

Once assigned, you can use your credentials as you would normally in your program to connect to your database.

## Connecting to a service

You must include the appropriate package for the type of services your application uses.

For example:

- Rabbit MQ through the `amqp` module
- `mongoose` modules
- MySQL through the `mysql` module
- Postgres through the `pg` module
- Redis through the `redis` module

## Add dependency to package.json

Edit `package.json` and add the intended module to the `dependencies` section. Normally, only one is necessary, but for the sake of the example, add all of them:

```
{
  "name": "hello-node",
  "version": "0.0.1",
  "dependencies": {
    "express": "*",
    "mongodb": "*",
    "mongoose": "*",
    "mysql": "*",
    "pg": "*",
  }
}
```

```

    "redis": "*",
    "amqp": "*"
},
"engines": {
  "node": "0.8.x"
}
}
}

```

You must run `npm shrinkwrap` to regenerate your `npm-shrinkwrap.json` file after you edit `package.json` file.

## PHP

In this section:

- [PHP buildpack](#)
- [Additional information about PHP buildpacks](#)
- [Getting started deploying PHP apps](#)
- [PHP buildpack configuration](#)
- [Composer](#)
- [Sessions](#)
- [New Relic](#)

## PHP buildpack

You can use the PHP buildpack with PHP or HHVM runtimes.

## Supported software and versions

The [release notes](#) page has a list of currently supported modules and packages.

- **PHP Runtimes**
  - `php-cli`
  - `php-cgi`
  - `php-fpm`
- **Third-Party Modules**
  - New Relic, in connected environments only.

## Push an app

### 30-second tutorial

With the [Cloud Foundry Command Line Interface](#) installed, open a shell, change directories to the root of your PHP files and push your application using the argument `-b`

`https://github.com/cloudfoundry/php-buildpack.git`.

Example:

```
$ mkdir my-php-app
$ cd my-php-app
$ cat << EOF > index.php
<?php
    phpinfo();
?>
EOF
$ cf push -m 128M -b https://github.com/cloudfoundry/php-buildpack.git my-php-app
```

Change **my-php-app** in the above example to a unique name on your target Cloud Foundry instance to prevent a hostname conflict error and failed push.

The previous example creates and pushes a test application, **my-php-app**, to Cloud Foundry. The **-b** argument instructs CF to use this buildpack. The remainder of the options and arguments are not specific to the buildpack, for questions on those consult the output of `cf help push`.

Here's a breakdown of what happens when you run the example:

- On your PC:
  - It creates a new directory and one PHP file, which just invokes `phpinfo()`
  - Run `cf` to push your application. This creates a new application with a memory limit of 128M (more than enough here) and upload our test file.
- Within Cloud Foundry:
  - The buildpack is run.
  - Application files are copied to the `htdocs` folder.
  - Apache HTTPD & PHP are downloaded, configured with the buildpack defaults and run.
  - Your application is accessible at the URL `http://my-php-app.example.com` (Replacing `example.com` with the domain of your public CF provider or private instance).

## More information about deployment

While the *30 Second Tutorial* shows how quick and easy it is to get started using the buildpack, it skips over quite a bit of what you can do to adjust, configure and extend the buildpack. The following sections and links provide a more in-depth look at the buildpack.

## Features

Here are some special features of the buildpack.

- Supports running commands or migration scripts prior to application startup.
- Supports an extension mechanism that allows the buildpack to provide additional functionality.
- Allows for application developers to provide custom extensions.
- Easy troubleshooting with the `BP_DEBUG` environment variable.
- Download location is configurable, allowing users to host binaries on the same network (i.e. run without an Internet connection)

- Smart session storage, defaults to file w/sticky sessions but can also use redis for storage.

## Examples

Here are some example applications that can be used with this buildpack.

- [php-info](#) This app has a basic index page and shows the output of `phpinfo()`.
- [PHPMyAdmin](#) A deployment of PHPMyAdmin that uses bound MySQL services.
- [PHPPgAdmin](#) A deployment of PHPPgAdmin that uses bound PostgreSQL services.
- [Drupal](#) A deployment of Drupal that uses bound MySQL service.
- [CodeIgniter](#) CodeIgniter tutorial application running on CF.
- [Stand Alone](#) An example which runs a standalone PHP script.
- [pgbouncer](#) An example which runs the PgBouncer process in the container to pool database connections.
- [phalcon](#) An example which runs a Phalcon based application.
- [composer](#) An example which uses Composer.

## Advanced topics

See the following topics:

- [Tips for PHP developers](#)
- [Getting started deploying PHP apps](#)
- [PHP buildpack configuration](#)
- [Composer](#)
- [Sessions](#)
- [New Relic](#)

You can find the source for the buildpack on GitHub: <https://github.com/cloudfoundry/php-buildpack>

## Proxy support

If you need to use a proxy to download dependencies during staging, you can set the `http_proxy` and/or `https_proxy` environment variables. For more information, see the [Proxy Usage Docs](#).

## BOSH configured custom trusted certificate support

For versions of PHP 5.6.0 and later, the default certificate location is `/usr/lib/ssl/certs`, which symlinks to `/etc/ssl/certs`. Your platform operator can configure the platform to add the custom certificates into the application container.

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need any further assistance.

For more information about using and extending the PHP buildpack in Cloud Foundry, see the [php-buildpack GitHub repository](#).

You can find current information about this buildpack on the PHP buildpack [release page](#) in GitHub.

## License

The Cloud Foundry PHP Buildpack is released under v2.0 of the [Apache License](#).

## PHP buildpacks in Cloud Foundry

For information about using and extending the PHP buildpack in Cloud Foundry, see the [php-buildpack GitHub repository](#).

You can find current information about this buildpack on the PHP buildpack [release page](#) in GitHub.

The buildpack uses a default PHP version specified in `.defaults/options.json` under the `PHP_VERSION` key.

To change the default version, specify the `PHP_VERSION` key in your app's `.bp-config/options.json` file.

## Getting started deploying PHP apps

Learn about deploying your PHP apps to Cloud Foundry. If you experience a problem deploying PHP apps, review the [Troubleshooting](#) section.

## Prerequisites

- Basic PHP knowledge
- [Cloud Foundry Command Line Interface \(cf CLI\)](#) installed on your workstation

## A first PHP application

```
$ mkdir my-php-app
$ cd my-php-app
$ cat << EOF > index.php
<?php
    phpinfo();
?>
EOF
$ cf push my-php-app -m 128M
```

Change “my-php-app” to a unique name or you may see an error and a failed push.

The previous example creates and pushes a test application to Cloud Foundry.

Here is a breakdown of what happens when you run the example:

- On your workstation...
  - It creates a new directory and one PHP file, which calls `phpinfo()`
  - Run `cf push` to push your application. This creates a new application with a memory limit of 128M and uploads our test file.

- On Cloud Foundry...
  - The buildpack detects that your app is a php app
  - The buildpack is run.
    - Application files are copied to the `htdocs` folder.
  - Apache HTTPD & PHP are downloaded, configured with the buildpack defaults, and run.
  - Your application is accessible at the default route. Run `cf app my-php-app` to view the url of your new app.

## Folder structure

The easiest way to use the buildpack is to put your assets and PHP files into a directory and push it to Cloud Foundry. This way, the buildpack takes your files and moves them into the `WEBDIR` (defaults to `htdocs`) folder, which is the directory where your chosen web server looks for the files.

## URL rewriting

If you select Apache as your web server, you can include `.htaccess` files with your application.

Also, you can provide your own Apache or Nginx configurations.

## Prevent access to PHP files

The buildpack puts all of your files into a publicly accessible directory. In some cases, you might want to have PHP files that are not publicly accessible but are on the `include_path`. To do that, create a `lib` directory in your project folder and place your protected files there.

For example:

```
$ ls -lRh
total 0
-rw-r--r-- 1 daniel staff    0B Feb 27 21:40 images
-rw-r--r-- 1 daniel staff    0B Feb 27 21:39 index.php
drwxr-xr-x 3 daniel staff 102B Feb 27 21:40 lib

./lib:
total 0
-rw-r--r-- 1 daniel staff    0B Feb 27 21:40 my.class.php  <-- not public,
http://app.cfapps.io/lib/my.class.php == 404
```

This comes with a catch. If your project legitimately has a `lib` directory, these files will not be publicly available because the buildpack does not copy a top-level `lib` directory into the `WEBDIR` folder. If your project has a `lib` directory that needs to be publicly available, then you have two options as follows:

### Option #1

In your project folder, create an `htdocs` folder (or whatever you've set for `WEBDIR`). Then move any files that can be publicly accessible into this directory. In the following example, the `lib/controller.php` file is publicly accessible.

Example:

```
$ ls -lRh
total 0
drwxr-xr-x 7 daniel staff 238B Feb 27 21:48 htdocs

./htdocs: <-- create the htdocs directory and put your files there
total 0
-rw-r--r-- 1 daniel staff 0B Feb 27 21:40 images
-rw-r--r-- 1 daniel staff 0B Feb 27 21:39 index.php
drwxr-xr-x 3 daniel staff 102B Feb 27 21:48 lib

./htdocs/lib: <-- anything under htdocs is public, including a lib directory
total 0
-rw-r--r-- 1 daniel staff 0B Feb 27 21:48 controller.php
```

Given this setup, it is possible to have both a public `lib` directory and a protected `lib` directory. The following example demonstrates this setup:

Example:

```
$ ls -lRh
total 0
drwxr-xr-x 7 daniel staff 238B Feb 27 21:48 htdocs
drwxr-xr-x 3 daniel staff 102B Feb 27 21:51 lib

./htdocs:
total 0
-rw-r--r-- 1 daniel staff 0B Feb 27 21:40 images
-rw-r--r-- 1 daniel staff 0B Feb 27 21:39 index.php
drwxr-xr-x 3 daniel staff 102B Feb 27 21:48 lib

./htdocs/lib: <-- public lib directory
total 0
-rw-r--r-- 1 daniel staff 0B Feb 27 21:48 controller.php

./lib: <-- protected lib directory
total 0
-rw-r--r-- 1 daniel staff 0B Feb 27 21:51 my.class.php
```

## Option #2

The second option is to pick a different name for the `LIBDIR`. This is a configuration option that you can set (it defaults to `lib`). Thus if you set it to something else such as `include`, your application's `lib` directory would no longer be treated as a special directory and it would be placed into `WEBDIR` (i.e. become public).

## Other folders

Beyond the `WEBDIR` and `LIBDIR` directories, the buildpack also supports a `.bp-config` directory and a `.extensions` directory.

The `.bp-config` directory exists at the root of your project directory and it is the location of application-specific configuration files. Application-specific configuration files override the default settings used by the buildpack. This link explains [application configuration files](#) in depth.

The `.extensions` directory also exists at the root of your project directory and it is the location of application-specific custom extensions. Application-specific custom extensions allow you, the developer, to override or enhance the behavior of the buildpack. See the [php-buildpack README](#) in GitHub for more information about extensions.

## Troubleshooting

To troubleshoot problems using the buildpack, you can do one of the following:

1. Review the output from the buildpack. The buildpack writes basic information to stdout, for example the files that it downloads. The buildpack also writes information in the form of stack traces when a process fails.
2. Review the logs from the buildpack. The buildpack writes logs to disk. Follow these steps to access these logs:
  1. SSH into the app container by running:

```
cf ssh APP-NAME
```

Where `APP-NAME` is the name of your app.

2. To view the logs, run:

```
cat app/.bp/logs/bp.log
```

By default, log files contain more detail than output to stdout. Set the `BP_DEBUG` environment variable to `true` for more verbose logging. This instructs the buildpack to set its log level to `DEBUG`, and to output logs to stdout. Follow [Environment Variables documentation](#) to set `BP_DEBUG`.

## Increasing log output with fpm.d

If you use `fpm.d`, follow these steps to configure `fpm` to redirect worker stdout and stderr into the logs:

1. Create a file in the `.bp-config/php/fpm.d/` directory of your app.
2. Add `catch_workers_output=yes` to the file you created.
3. Push your app.

For more information about allowed configuration settings in the `.bp-config/php/fpm.d` directory, see the [List of global php-fpm.conf directives](#).

You can see an example `fpm` fixture and configuration file in the [php-buildpack GitHub repository](#).

## PHP buildpack configuration

You can modify the configuration file for your PHP buildpack.

The PHP buildpack stores all default configuration settings in the `defaults` directory of the Cloud Foundry PHP Buildpack repository on GitHub.

## options.json file

The `options.json` file is the configuration file for the buildpack itself. It instructs the buildpack what to download, where to download it from, and how to install it. It allows you to configure:

- Package names and versions, such as PHP, HTTPD, or Nginx versions.
- The web server to use, such as HTTPD, Nginx, or no server.
- The PHP extensions that are enabled.

The buildpack overrides the default `options.json` file with any configuration it finds in the `.bp-config/options.json` file of your app.

Here are explanations of the common options you might need to change:

Variable	Explanation
WEB_SERVER	Sets the web server to use. Must be one of <code>httpd</code> , <code>nginx</code> , or <code>none</code> . This value defaults to <code>httpd</code> .
HTTPD_VERSION	Sets the version of Apache HTTPD to use. Currently the build pack supports the latest stable version. This value defaults to the latest release that is supported by the build pack.
ADMIN_EMAIL	The value used in HTTPD's configuration for <code>ServerAdmin</code>
NGINX_VERSION	Sets the version of Nginx to use. By default, the buildpack uses the latest stable version.
PHP_VERSION	Sets the version of PHP to use. Set to a minor instead of a patch version, such as " <code>{PHP_70_LATEST}</code> ". See <code>options.json</code> .
PHP_EXTENSION_S	(DEPRECATED) A list of the extensions to enable. <code>bz2</code> , <code>zlib</code> , <code>curl</code> , and <code>mcrypt</code> are enabled by default.
ZEND_EXTENSIONS	A list of the Zend extensions to enable. Nothing is enabled by default.
APP_START_CMD	When the <code>WEB_SERVER</code> option is set to <code>none</code> , this command is used to start your app. If <code>WEB_SERVER</code> and <code>APP_START_CMD</code> are not set, then the buildpack searches, in order, for <code>app.php</code> , <code>main.php</code> , <code>run.php</code> , or <code>start.php</code> . This option accepts arguments.
WEBDIR	The root directory of the files served by the web server specified in <code>WEB_SERVER</code> . Defaults to <code>htdocs</code> . Other common settings are <code>public</code> , <code>static</code> , or <code>html</code> . The path is relative to the root of your app.
LIBDIR	This path is added to PHP's <code>include_path</code> . Defaults to <code>lib</code> . The path is relative to the root of your app.
HTTP_PROXY	The buildpack downloads uncached dependencies using HTTP. If you are using a proxy for HTTP access, set its URL here.
HTTPS_PROXY	The buildpack downloads uncached dependencies using HTTPS. If you are using a proxy for HTTPS access, set its URL here.
ADDITIONAL_PRE_PROCESS_CMDS	A list of additional commands that run prior to the app starting. For example, you might use this command to run migration scripts or static caching tools before the app launches.

For details about supported versions, see the release notes for your buildpack version on the [Releases](#) page of the Cloud Foundry PHP Buildpack repository on GitHub.

## HTTPD, Nginx, and PHP configuration

The buildpack automatically configures HTTPD, Nginx, and PHP for your app. This section explains how to modify the configuration.

The `.bp-config` directory in your app can contain configuration overrides for these components. Name the directories `httpd`, `nginx`, and `php`. VMware recommends that you use `php.ini.d` or `fpm.d`.

If you override the `php.ini` or `php-fpm.conf` files, many other forms of configuration do not work.

For example:

```
.bp-config
  httpd
  nginx
  php
```

Each directory can contain configuration files that the component understands.

For example, to change HTTPD logging configuration, run:

```
ls -l .bp-config/httpd/extra/
total 8
-rw-r--r-- 1 daniel staff 396 Jan 3 08:31 httpd-logging.conf
```

In this example, the `httpd-logging.conf` file overrides the one provided by the buildpack. VMware recommends that you copy the default from the buildpack and modify it.

You can find the default configuration files in the [PHP Buildpack /defaults/config directory](#).

You must be careful when modifying configurations, as doing so can cause your app to fail, or cause Cloud Foundry to fail to stage your app.

You can add your own configuration files. The components do not reference them, so you must ensure that they are included. For example, you can add an include directive to the [httpd configuration](#) to include your file:

```
ServerRoot "${HOME}/httpd"
Listen ${PORT}
ServerAdmin "${HTTPD_SERVER_ADMIN}"
ServerName "0.0.0.0"
DocumentRoot "${HOME}/#${WEBDIR}"
Include conf/extra/httpd-modules.conf
Include conf/extra/httpd-directories.conf
Include conf/extra/httpd-mime.conf
Include conf/extra/httpd-logging.conf
Include conf/extra/httpd-mpm.conf
Include conf/extra/httpd-default.conf
Include conf/extra/httpd-remoteip.conf
Include conf/extra/httpd-php.conf
Include conf/extra/httpd-my-special-config.conf # This line includes your additional file.
```

## .bp-config/php/php.ini.d/

The buildpack adds any `.bp-config/php/php.ini.d/FILE-NAME.ini` files it finds in the app to the PHP configuration. You can use this to change any value acceptable to `php.ini`. For a list of directives, see <http://php.net/manual/en/ini.list.php>.

For example, adding a file `.bp-config/php/php.ini.d/something.ini` to your app, with the following contents, overrides both the default charset and mimetype:

```
default_charset="UTF-8"
default_mimetype="text/xhtml"
```

### Precedence

In order of highest precedence, PHP configuration values come from the following sources:

- PHP scripts using `ini_set()` to manually override config files
- `user.ini` files for local values
- `.bp-config/php/php.ini.d` to override main value, but not local values from user.ini files

## .bp-config/php/fpm.d/

The buildpack adds any files it finds in the app under `.bp-config/php/fpm.d` that end with `.conf` (i.e `my-config.conf`) to the PHP-FPM configuration. You can use this to change any value acceptable to `php-fpm.conf`. For a list of directives, see <http://php.net/manual/en/install.fpm.configuration.php>.

PHP FPM config snippets are included by the buildpack into the global section of the configuration file. If you need to apply configuration settings for a PHP FPM worker, you must indicate this in your configuration file.

For example:

```
; This option is specific to the `www` pool
[www]
catch_workers_output = yes
```

## PHP Extensions

The buildpack adds any `.bp-config/php/php.ini.d/FILE-NAME.ini` files it finds in the app to the PHP configuration. You can use this to enable PHP or ZEND extensions. For example:

```
extension=redis.so
extension=gd.so
zend_extension=opcache.so
```

If an extension is already present and enabled in the compiled PHP, such as `intl`, you do not need to explicitly enable it to use that extension.

### PHP\_EXTENSIONS vs. ZEND\_EXTENSIONS

PHP has two kinds of extensions, *PHP extensions* and *Zend extensions*. These hook into the PHP executable in different ways. For more information about the way extensions work internally in the engine, see <https://wiki.php.net/internals/extensions>.

Because they hook into the PHP executable in different ways, they are specified differently in ini files. Apps fail if a Zend extension is specified as a PHP extension, or a PHP extension is specified as a Zend extension.

If you see the following error:

```
php-fpm | [warn-ioncube] The example Loader is a Zend-Engine extension and not a module (pid 40)
php-fpm | [warn-ioncube] Please specify the Loader using 'zend_extension' in php.ini (pid 40)
php-fpm | NOTICE: PHP message: PHP Fatal error: Unable to start example Loader module in Unknown on line 0
```

Then move the `example` extension from `extension` to `zend_extension` and re-push your app.

If you see the following error:

```
NOTICE: PHP message: PHP Warning: example MUST be loaded as a Zend extension in Unknown on line 0
```

Then move the `example` extension from `zend_extension` to `extension` and re-push your app.

## Buildpack extensions

The buildpack comes with extensions for its default behavior. These are the [HTTPD](#), [Nginx](#), [PHP](#), and [NewRelic](#) extensions.

The buildpack is designed with an extension mechanism, allowing app developers to add behavior to the buildpack without modifying the buildpack code.

When you push an app, the buildpack runs any extensions found in the `.extensions` directory of your app.

For more information about writing extension, see the [Cloud Foundry PHP Buildpack](#) repository on GitHub.

## Composer

Composer is activated when you supply a `composer.json` or `composer.lock` file. A `composer.lock` is not required, but is strongly recommended for consistent deployments.

You can require dependencies for packages and extensions. Extensions must be prefixed with the standard `ext-`. If you reference an extension that is available to the buildpack, it automatically is installed. See the main [README](#) for a list of supported extensions.

The buildpack uses the version of PHP specified in your `composer.json` or `composer.lock` file. Composer settings override the version set in the `options.json` file.

The PHP buildpack supports a subset of the version formats supported by Composer. The buildpack supported formats are:

Example	Expected Version
5.3.*	latest 5.4.x release (5.3 is not supported)
>=5.3	latest 5.4.x release (5.3 is not supported)
5.4.*	latest 5.4.x release
>=5.4	latest 5.4.x release
5.5.*	latest 5.5.x release
>=5.5	latest 5.5.x release
5.4.x	specific 5.4.x release that is listed
5.5.x	specific 5.5.x release that is listed

## Configuration

The buildpack runs with a set of default values for Composer. You can adjust these values by adding a `.bp-config/options.json` file to your application and setting any of the following values in it.

Variable	Explanation
COMPOSER_VERSION	The version of Composer to use. It defaults to the latest bundled with the buildpack.
COMPOSER_INSTALL_OPTIONS	A list of options that should be passed to <code>composer install</code> . This defaults to <code>["--no-interaction", "--no-dev", "--no-progress"]</code> . The <code>--no-progress</code> option must be used due to the way the buildpack calls Composer.
COMPOSER_VENDOR_DIR	Allows you to override the default value used by the buildpack. This is passed through to Composer and instructs it where to create the <code>vendor</code> directory. Defaults to <code>{BUILD_DIR}/{LIBDIR}/vendor</code> .
COMPOSER_BIN_DIR	Allows you to override the default value used by the buildpack. This is passed through to Composer and instructs it where to place executables from packages. Defaults to <code>{BUILD_DIR}/php/bin</code> .
COMPOSER_CACHE_DIR	Allows you to override the default value used by the buildpack. This is passed through to Composer and instructs it where to place its cache files. Generally you should not change this value. The default is <code>{CACHE_DIR}/composer</code> which is a subdirectory of the cache folder passed in to the buildpack. Composer cache files are restored on subsequent application pushes.

By default, the PHP buildpack uses the `composer.json` and `composer.lock` files that reside inside the root directory, or in the directory specified as `WEBDIR` in your `options.json`. If you have composer files inside your app, but not in the default directories, use a `COMPOSER_PATH` environment variable for your app to specify this custom location, relative to the app root directory. Note, that the `composer.json` and `composer.lock` files must be in the same directory.

## GitHub API request limits

Composer uses GitHub's API to retrieve zip files for installation into the application folder. If you do not vendor dependencies before pushing an app, Composer can fetch dependencies during staging using the GitHub API.

GitHub's API is request-limited. If you reach your daily allowance of API requests (typically 60), GitHub's API returns a `403` error and staging fails.

There are two ways to avoid the request limit:

- Vendor dependencies before pushing your application.
- Supply a GitHub OAuth API token.

## Vendor dependencies

For vendor dependencies, you must run `composer install` before you push your application. You might also need to configure `COMPOSER_VENDOR_DIR` to “vendor”.

## Supply a GitHub token

Composer can use [GitHub API OAuth tokens](#), which increase your request limit, typically to 5000 per day.

During staging, the buildpack looks for this token in the environment variable `COMPOSER_GITHUB_OAUTH_TOKEN`. If you supply a valid token, Composer uses it. This mechanism does not work if the token is invalid.

To supply the token, use one of the following methods:

- Run:
 

```
cf set-env YOUR_APP_NAME COMPOSER_GITHUB_OAUTH_TOKEN "OAUTH_TOKEN_VALUE"
```
- Add the token to the `env` block of your application manifest.

## Buildpack staging environment

Composer runs in the buildpack staging environment. Variables set with `cf set-env` or with a `manifest.yml` ‘env’ block are visible to Composer.

For example:

```
$ cf push a_symfony_app --no-start
$ cf set-env a_symfony_app SYMFONY_ENV "prod"
$ cf start a_symfony_app
```

In this example, `a_symfony_app` is supplied with an environment variable, `SYMFONY_ENV`, which is visible to Composer and any scripts started by Composer.

## Non-configurable environment variables

User-assigned environment variables are applied to staging and runtime. Unfortunately, `LD_LIBRARY_PATH` and `PHPRC` must be different for staging and runtime. The buildpack takes care of setting these variables, which means user values for these variables are ignored.

## Sessions

When your application has one instance, it's generally safe to use the default session storage, which is the local file system. You can only see problems if your single instance crashes, the local file system goes away, and you lose your sessions. For many applications, this works just fine, but you need to consider how this affects your application.

If you have multiple application instances or you need a more robust solution for your application, use Redis or Memcached as a backup store for your session data. The buildpack supports both backups and when one is bound to your application, it detects it and configures PHP to use it for session storage.

By default, there is no configuration necessary. To create a Redis or Memcached service, ensure that the service name contains `redis-sessions` or `memcached-sessions` and then bind the service to the application.

Example:

```
$ cf create-service redis some-plan app-redis-sessions
$ cf bind-service app app-redis-sessions
$ cf restage app
```

If you want to use a specific service instance or change the search key, you can set either `REDIS_SESSION_STORE_SERVICE_NAME` or `MEMCACHED_SESSION_STORE_SERVICE_NAME` in `.bp-config/options.json` to the new search key. The session configuration extension searches the bound services by name for the new session key.

## Configuration changes

When detected, the following changes are made:

### Redis

- the `redis` PHP extension is installed, which provides the session save handler
- `session.name` is set to `PHPSESSIONID` which deactivates sticky sessions
- `session.save_handler` is configured to `redis`
- `session.save_path` is configured based on the bound credentials, for example `tcp://host:port?auth=pass`

### Memcached

- the `memcached` PHP extension is installed, which provides the session save handler
- `session.name` is set to `PHPSESSIONID` which deactivates sticky sessions
- `session.save_handler` is configured to `memcached`
- `session.save_path` is configured based on the bound credentials (i.e. `PERSISTENT=app_sessions host:port`)
- `memcached.sess_binary` is set to `On`
- `memcached.use_sasl` is set to `On`, which enables authentication

- `memcached.sess_sasl_username` and `memcached.sess_sasl_password` are set with the service credentials

## New Relic

New Relic collects analytics about your application and client side performance.

## Configuration

You can configure New Relic for the PHP buildpack in one of two ways:

- License key
- Cloud Foundry service

### With a license key

Use this method if you already have a New Relic account. Use these steps:

1. In a web browser, go to the New Relic website to find your [license key](#).
2. Set the value of the environment variable `NEWRELIC_LICENSE` to your New Relic license key, either through the [manifest.yml file](#) or by running the `cf set-env` command.

For more information, see <https://github.com/cloudfoundry/php-buildpack#supported-software>

### With a Cloud Foundry service

To configure New Relic for the PHP buildpack with a Cloud Foundry service, bind a New Relic service to the app. The buildpack automatically detects and configures New Relic.

Your `VCAP_SERVICES` environment variable must contain a service named `newrelic`, the `newrelic` service must contain a key named `credentials`, and the `credentials` key must contain named `licenseKey`.



You cannot configure New Relic for the PHP buildpack with user provided services.

## Python buildpack

You can push your Python app to Cloud Foundry and configure your Python app to use the Python buildpack.

### Push an app

Cloud Foundry automatically uses this buildpack if it detects a `requirements.txt` or `setup.py` file in the root directory of your project.

If your Cloud Foundry deployment does not have the Python Buildpack installed, or the installed version is out of date, you can use the latest version by specifying it with the `-b` option when you push your app. For example:

```
$ cf push my_app -b https://github.com/cloudfoundry/python-buildpack.git
```

## Supported versions

You can find the list of supported Python versions in the [Python buildpack release notes](#).

## Specify a Python version

You can specify a version of the Python runtime by including it within a `runtime.txt` file. For example:

```
$ cat runtime.txt
python-3.5.2
```

The buildpack only supports the stable Python versions, which are listed in the `manifest.yml` and [Python buildpack release notes](#).

To request the latest Python version in a patch line, replace the patch version with `x: 3.6.x`. To request the latest version in a minor line, replace the minor version: `3.x`.

If you try to use a binary that is not currently supported, staging your app fails and you see the following error message:

```
Could not get translated url, exited with: DEPENDENCY_MISSING_IN_MANIFEST:
...
!
!     exit
!
Staging failed: Buildpack compilation step failed
```

## Specify a PIP version

The Python buildpack supports dependency installation using PIP when a `requirements.txt` file is included at the top level of your app's directory. By default, the PIP module built into Python is used when staging your app. The version of PIP used in this case depends on which version of Python is being used.

To use the latest version of PIP, set the `BP_PIP_VERSION` environment variable to `latest` before staging your app by doing either of the following:

- Use `cf set-env`. Enter `cf help set-env` for more information.
- Set the PIP version in the app manifest. See *Environment Variables* in [App Manifest Attribute Reference](#).

Currently, only `latest` is supported when setting `BP_PIP_VERSION`. The buildpack does not provide multiple versions of its independent PIP dependency. You can inspect the buildpack's releases to determine which version of PIP is currently provided. See [Python buildpack releases](#) on GitHub.

## Specify a start command

The Python buildpack does not generate a [default start command](#) for your apps.

To stage with the Python buildpack and start an app, do one of the following:

- Supply a Procfile. For more information about Procfiles, see the [Configuring a Production Server](#) topic. The following example Procfile specifies `gunicorn` as the start command for a web app running on Gunicorn:

```
web: gunicorn SERVER-NAME:APP-NAME
```

- Specify a start command with `-c`. The following example specifies `waitress-serve` as the start command for a web app running on Waitress:

```
$ cf push python-app -c "waitress-serve --port=$PORT DJANGO-WEB-APP.wsgi:MY-APP"
```

- Specify a start command in the application manifest by setting the `command` attribute. For more information, see the [Deploying with App Manifests](#) topic.

## Run the web server

The Python buildpack expects the Python app to listen to port 8080. You can use the exposed `PORT` variable to start the web server on the port that Cloud Foundry expects on all network interfaces.

For example, you can do the following using Flask:

```
if __name__ == "__main__":
    port = int(os.getenv("PORT", 8080))
    app.run(host='0.0.0.0', port=port)
```

The `PORT` variable is not visible in the GUI or the `cf env MY-APP` command.

## Vendor app dependencies

If you are deploying in an environment that is disconnected from the Internet, your application must vendor its dependencies. For more information, see [Disconnected environments](#) in the `cloudfoundry/buildpack-packager` GitHub repository.

For the Python buildpack, use `pip`:

```
$ cd YOUR-APP-DIR
$ mkdir -p vendor

# vendors pip *.whl into vendor/
$ pip download -r requirements.txt --no-binary=:none: -d vendor
```

`cf push` uploads your vendored dependencies. The buildpack installs them directly from the `vendor/` directory.

To ensure proper installation of dependencies, VMware recommends binary vendored dependencies (wheels). The preceding `pip download` command achieves this.

## Private dependency repository

To deploy apps in an environment that needs to use a private dependency repository, you have the following options:

- [PIP](#)
- [Conda](#)

## PIP

To install dependencies using PIP, add the URL of the repository to the `requirements.txt` file in the following format:

```
--index-url=https://example.com/api/pypi/ext_pypi/simple
fixtures==2.0.0
```

If the private repository uses a custom SSL certificate that is installed on the platform, you may see an error similar to the following:

```
Could not fetch URL https://example.com/api/pypi/ext_pypi/simple/fixtures/:
There was a problem confirming the ssl certificate:
[SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed (_ssl.c:777) - skipping
```

This error occurs because `pip` does not use system certificates by default. To resolve this issue, set the `PIP_CERT` environment variable in the `manifest.yml` file to point to the system certificate store.

For example:

```
---
env:
  PIP_CERT: /etc/ssl/certs/ca-certificates.crt
```

## Conda

To install dependencies using Conda, add a `channels` block to the `environment.yml` file.

In the `channels` block, list custom channels and add `nodelfaults`. Specifying `nodelfaults` tells Conda to only use the channels in the channels block.

For example:

```
channels:
  - https://conda.example.com/repo
  - nodelfaults
```

If the private repository uses a custom SSL certificate that is installed on the platform, you may see an error similar to the following:

```
Error: Connection error: [SSL: CERTIFICATE_VERIFY_FAILED] certificate verify
failed (_ssl.c:581):
```

This error occurs because `conda` does not use system certificates by default. To resolve this issue, set the `CONDA_SSL_VERIFY` environment variable in the `manifest.yml` file to point to the system certificate store.

For example:

```
---
env:
  CONDA_SSL_VERIFY: /etc/ssl/certs/ca-certificates.crt
```

## Parse environment variables

The `cfenv` package provides access to Cloud Foundry application environment settings by parsing all the relevant environment variables. The settings are returned as a class instance. See <https://github.com/jmcarp/py-cfenv> for more information.

## Miniconda support (starting in buildpack version 1.5.6)

To use miniconda instead of pip for installing dependencies, place an `environment.yml` file in the root directory.

## Pipenv support (starting in buildpack version 1.5.19)

To use `Pipenv` instead of pip (directly) for installing dependencies, place a `Pipfile` in the root directory. Easiest to let Pipenv generate this for you.

## NLTK support

To use NLTK corpora in your app, you can include an `nltk.txt` file in the root of your application. Each line in the file specifies one dataset to download. The full list of data sets available this way can be found [on the NLTK website](#). The `id` listed for the corpora on that page is the string you must include in your app's `nltk.txt`.

Example `nltk.txt`:

```
brown
wordnet
```

Having an `nltk.txt` file only causes the buildpack to download the corpora. You still must specify NLTK as a dependency of your app if you want to use it to process the corpora files.

## Proxy support

If you need to use a proxy to download dependencies during staging, you can set the `http_proxy` and `https_proxy` environment variables. For more information, see [Using a Proxy](#).

## BOSH configured custom trusted certificate support

Versions of Python 2.7.9 and later use certificates stored in `/etc/ssl/certs`. Your platform operator can configure the platform to [add the custom certificates into the application container](#).

To configure your Python applications to make HTTP requests with this custom certificate, set the environment variable `REQUESTS_CA_BUNDLE="/etc/ssl/certs/ca-certificates.crt"`.

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need any further assistance.

For more information about using and extending the Python buildpack in Cloud Foundry, see [Python buildpack](#).

You can find current information about this buildpack on the [Python buildpack release page](#) in GitHub.

## R buildpack

You can push your R app to Cloud Foundry and configure your R app to use the R buildpack.

Cloud Foundry automatically uses the R buildpack if it detects a `r.yml` file in the root directory of your project.

If your Cloud Foundry deployment does not have the R buildpack installed, or the installed version is out of date, you can use the latest version by specifying it with the `-b` option when you push your app.

For example:

```
$ cf push my_app -b https://github.com/cloudfoundry/r-buildpack.git
```

## Supported versions

You can find the list of supported R versions in the [R buildpack release notes](#).

## Start command

The R buildpack does not generate a default start command for your applications. Instead, you must specify a start command for your app.

To stage an app with the R buildpack and start the app, do one of the following:

- **Option 1:** Supply a Procfile. For more information about Procfiles, see [Production Server Configuration](#). The following example Procfile specifies `R -f` as the start command for a web app with the entrypoint `simple.r`:

```
web: R -f simple.r
```

- **Option 2:** Specify a start command with `-c`:

```
$ cf push r-app -c "R -f simple.r"
```

- **Option 3:** Specify a start command in the application manifest by setting the `command` attribute. For more information, see the [Deploying with Application Manifests](#) topic.

For more information about starting apps, see [Starting, Restarting, and Restaging Applications](#).

# Specifying app dependencies

As of v1.1.21, the following packages are provided by the R buildpack:

- Rserve
- forecast
- plumber
- shiny

To specify additional packages needed by your app, provide the CRAN mirror and names of the packages inside your `r.yml` file. You can also specify the number of threads to use for parallel installation. Optionally, you can also specify the `dependencies` argument of `install.packages`, which defaults to `TRUE` when left out. For example:

```
---
packages:
- cran_mirror: https://cran.r-project.org
  num_threads: 2
  dependencies:
    - Depends
    - Imports
  packages:
    - name: stringr
    - name: jsonlite
```

# Vendoring app dependencies

If you are deploying in an environment that is disconnected from the Internet, you must *vendor* your app's dependencies, which means you must make these packages available for offline use. You can vendor dependencies by using a package manager.

To set up your own custom, local CRAN-like repository to vendor your packages, create the `src/contrib` directories and populate them with your package source tarballs. For more information, see [How to Set Up a Custom CRAN-like Repository](#) published on the *Packrat Documentation* site.

Add the `src/contrib` directories containing your package tarballs to a `vendor_r` directory at the root of your app. This directory is named `vendor_r` so as not to conflict with vendor directories of other languages, such as `python`.

Then, inside your `r.yml`, provide the names of your vendored packages in the `packages` list:

```
---
packages:
- packages:
  - name: stringr
  - name: jsonlite
```

`cf push` uploads your vendored dependencies. The buildpack installs them directly from the `vendor_r/` directory.

Example app directory tree:

```

└── r.yml
├── simple-app.r
└── vendor_r
    └── src
        └── contrib
            ├── PACKAGES
            ├── PACKAGES.gz
            ├── jsonlite_1.5.tar.gz
            └── stringr_1.3.1.tar.gz

```

For more information about using buildpacks in disconnected environments, see [Disconnected environments](#).

## Proxy support

If you need to use a proxy to download dependencies during staging, you can set the `http_proxy` and `https_proxy` environment variables. For more information, see [Using a Proxy](#).

## BOSH configured custom trusted certificate support

R uses certificates stored in `/etc/ssl/certs`. Your platform operator can configure the platform to add the custom certificates into the application container. For more information, see [Configuring Trusted System Certificates for Applications](#).

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need any further assistance.

For more information about using and extending the R buildpack in Cloud Foundry, see the [R-buildpack GitHub repository](#).

You can also find current information about this buildpack on the [R buildpack release page](#) in GitHub.

## Ruby

In this section:

- [Ruby buildpack](#)
- [Tips for Ruby developers](#)
- [Getting started deploying Ruby apps](#)
  - [Getting started deploying Ruby apps](#)
  - [Getting started deploying Ruby on Rails apps](#)
- [Configuring Rake Tasks for deployed apps](#)
- [Environment variables defined by Ruby buildpack](#)
- [Configuring service connections for Ruby](#)
- [Windows Gemfiles support](#)

## Ruby buildpack

Cloud Foundry uses the Ruby buildpack if your app has a `Gemfile` and `Gemfile.lock` in the root directory. The Ruby buildpack uses Bundler to install your dependencies.

If your Cloud Foundry deployment does not have the Ruby buildpack installed or the installed version is out of date, push your app with the `-b` option to specify the buildpack:

```
$ cf push MY-APP -b https://github.com/cloudfoundry/ruby-buildpack.git
```

For more detailed information about deploying Ruby applications see the following topics:

- [Tips for Ruby developers](#)
- [Getting started deploying apps](#)
- [Configuring Rake Tasks for deployed apps](#)
- [Environment variables defined by the Ruby buildpack](#)
- [Configuring service connections for Ruby](#)
- [Support for Windows Gemfiles](#)

See the source for the Ruby buildpack in the [Ruby buildpack repository](#) on GitHub.

## Supported versions

See the supported Ruby versions in the [release notes for the Ruby buildpack](#) on GitHub.

## Specify a Ruby version

You can specify specific versions of the Ruby runtime in the `Gemfile` for your app as described in the following sections.

If you don't specify a version of the Ruby runtime, the default Ruby version listed in the [buildpack manifest.yml file](#) is used.

### MRI

For MRI, specify the version of Ruby in your `Gemfile` as follows:

```
ruby '~> 2.2.3'
```

With this example declaration in the `Gemfile`, if Ruby versions `2.2.4`, `2.2.5`, and `2.3.0` are present in the Ruby buildpack, the app uses Ruby version `2.2.5`.

For more information about the `ruby` directive for Bundler Gemfiles, see the [Bundler documentation](#).

If you use v1.6.18 or earlier, you must specify an exact version, such as `ruby '2.2.3'`. In Ruby Buildpack [v1.6.18](#) and earlier, Rubygems do not support version operators for the `ruby` directive.

### JRuby

For JRuby, specify the version of Ruby in your `Gemfile` based on the version of JRuby your app uses.

JRuby version `1.7.x` supports either `1.9` mode or `2.0` mode.

- For `1.9` mode, use:

```
ruby '1.9.3', :engine => 'jruby', :engine_version => '1.7.25'
```

- For `2.0` mode, use:

```
ruby '2.0.0', :engine => 'jruby', :engine_version => '1.7.25'
```

For Jruby version `>= 9.0`, use:

```
ruby '2.2.3', :engine => 'jruby', :engine_version => '9.0.5.0'
```

The Ruby buildpack only supports the stable Ruby versions listed in the `manifest.yml` and [release notes for the Ruby buildpack](#) on GitHub.

If you try to use a binary that is not supported, staging your app fails with the following error message:

```
Could not get translated url, exited with: DEPENDENCY_MISSING_IN_MANIFEST: ...
!
!     exit
!
Staging failed: Buildpack compilation step failed
```

The Ruby buildpack does not support the pessimistic version operator `~>` on the Gemfile `ruby` directive for JRuby.

## Vendor app dependencies

As stated in the [Disconnected Environments documentation](#), your application must ‘vendor’ its dependencies.

For the Ruby buildpack, use the `bundle package --all` command in Bundler to vendor the dependencies.

Example:

```
$ cd my-app-directory
bundle package --all
```

The `cf push` command uploads your vendored dependencies. The Ruby buildpack compiles any dependencies requiring compilation while staging your app.

## Buildpack logging and application logging

The Ruby buildpack only runs during staging, and only logs what is important to staging, such as what is being downloaded, what the configuration is, and work that the buildpack does on your application.

The buildpack stops logging when the staging is complete. The Loggregator handles application logging.

Your application must write to `stdout` or `stderr` for its logs to be included in the Loggregator stream. For more information, see [Application Logging in Cloud Foundry](#).

If you are deploying a Rails application, the buildpack might not automatically install the necessary plug-in or gem for logging, depending on the Rails version of the application:

- Rails v2.x: The buildpack automatically installs the `rails_log_stdout` plugin into the application. For more information about the `rails_log_stdout` plugin, see the [GitHub README](#).
- Rails v3.x: The buildpack automatically installs the `rails_12factor` gem if it is not present and issues a warning message. You must add the `rails_12factor` gem to your `Gemfile` to quiet the warning message. For more information about the `rails_12factor` gem, see the [GitHub README](#).
- Rails v4.x: The buildpack issues a warning message that the `rails_12factor` gem is not present, but does not install the gem. You must add the `rails_12factor` gem to your `Gemfile` to quiet the warning message. For more information about the `rails_12factor` gem, see the [GitHub README](#).

For more information about the `rails_12factor` gem, see [GitHub README](#).

## Proxy support

If you need to use a proxy to download dependencies during staging, set the `http_proxy` and `https_proxy` environment variables. For more information, see [Using a Proxy](#).

## BOSH configured custom trusted certificate support

Ruby uses certificates stored in `/etc/ssl/certs`. Your platform operator can configure the platform to add the custom certificates into the application container.

For information about providing trusted certificates to applications running on TAS for VMs, see [Trusted system certificates](#).

## Help and support

Join the `#buildpacks` channel in our [Slack community](#) if you need help.

For more information about using and extending the Ruby buildpack in Cloud Foundry, see the [Ruby buildpack repository](#) on GitHub.

See the current information about the Ruby buildpack in the [release notes for the Ruby buildpack](#) on GitHub.

## Tips for Ruby developers

You can deploy Rack, Rails, or Sinatra apps with Cloud Foundry.

## App bundling

You must run Bundler to create a `Gemfile` and a `Gemfile.lock`. These files must be in your app before you push to Cloud Foundry.

To download Bundler, see [Gem Bundler](#).

## Rack config file

For Rack and Sinatra, you must have a `config.ru` file. For example:

```
require './hello_world'  
run HelloWorld.new
```

## Asset pre compilation

Cloud Foundry supports the Rails asset pipeline. If you do not precompile assets before deploying your app, Cloud Foundry precompiles them when staging the app. Precompiling before deploying reduces the time it takes to stage an app.

To precompile assets before deployment, run:

```
rake assets:precompile
```

The Rake precompile task re-initializes the Rails app. This could pose a problem if initialization requires service connections or environment checks that are unavailable during staging. To prevent re-initialization during pre-compilation, add the following line to `application.rb`:

```
config.assets.initialize_on_precompile = false
```

If the `assets:precompile` task fails, Cloud Foundry uses live compilation mode, the alternative to asset precompilation. In this mode, assets are compiled when they are loaded for the first time. You can force live compilation by adding the following line to `application.rb`.

```
Rails.application.config.assets.compile = true
```

## Running Rake tasks

Cloud Foundry does not provide a mechanism for running a Rake task on a deployed app. If you need to run a Rake task that must be performed in the Cloud Foundry environment, rather than locally before deploying or redeploying, you can configure the command that Cloud Foundry uses to start the app to invoke the Rake task.

An app start command is configured in the app manifest file, `manifest.yml`, using the `command` attribute.

For more information about app manifests and supported attributes, see [Deploying with App Manifests](#).

### Example: Invoking a Rake database migration task at App startup

See the following example of migrating a database schema using a Rake task.

For more information about migrating database schemas, see the [Migrate a Database Schema](#) section of the *Services Overview* topic.

To migrate a database schema using a Rake task:

1. If a Rakefile does not exist, create one and add it to your app directory.
2. In your Rakefile, add a Rake task to limit an idempotent command to the first instance of a deployed app:

```

namespace :cf do
  desc "Only run on the first application instance"
  task :on_first_instance do
    instance_index = JSON.parse(ENV["VCAP_APPLICATION"])["instance_index"] rescue nil
    exit(0) unless instance_index == 0
  end
end

```

- Add the task to the `manifest.yml` file, referencing the idempotent command `rake db:migrate` with the `command` attribute:

```

---
applications:
- name: my-rails-app
  command: bundle exec rake cf:on_first_instance db:migrate && bundle exec rails s -p $PORT -e $RAILS_ENV

```

- Update the app by running:

```
cf push
```

## Rails 3 worker tasks

Learn how to create and deploy an example Rails app that uses a worker library to defer a task that a separate app runs. It also describes how to scale the resources available to the worker app.

Most worker tasks do not serve external requests. Use the `-no-route` flag with the `cf push` command, or `no-route: true` in the app manifest, to suppress route creation. If you are using cf CLI v7 or later, be aware that the `-no-route` flag no longer unbinds all existing routes associated with the app.

### Choose a worker task library

You must choose a worker task library.

The following table summarizes the three main libraries available for Ruby/Rails:

Library	Description
<code>Delayed::Job</code>	A direct extraction from <a href="#">Shopify</a> where the job table is responsible for a multitude of core tasks.
<code>Resque</code>	A Redis-backed library for creating background jobs, placing those jobs on multiple queues, and processing them later.
<code>Sidekiq</code>	Uses threads to handle many messages at the same time in the same process. It does not require Rails, but integrates tightly with Rails 3 to simplify background message processing. This library is Redis-backed and semi-compatible with Resque messaging.

For other alternatives, see [Background Jobs](#) on The Ruby Toolbox.

### Creating an example app

The example app described in this section uses Sidekiq.

To create an example app:

1. Create a Rails app with an arbitrary model named “Things” by running:

```
rails create rails-sidekiq
cd rails-sidekiq
rails g model Thing title:string description:string
```

2. Add `sidekiq` and `uuidtools` to the Gemfile:

```
source 'https://rubygems.org'

gem 'rails', '3.2.9'
gem 'mysql2'

group :assets do
  gem 'sass-rails',    '~> 3.2.3'
  gem 'coffee-rails',  '~> 3.2.1'
  gem 'uglifier',     '>= 1.0.3'
end

gem 'jquery-rails'
gem 'sidekiq'
gem 'uuidtools'
```

3. Install the bundle by running:

```
bundle install
```

4. In `app/workers`, create a worker for Sidekiq to carry out its tasks by running:

```
touch app/workers/thing_worker.rb
```

Create the worker as follows:

```
class ThingWorker

  include Sidekiq::Worker

  def perform(count)

    count.times do

      thing_uuid = UUIDTools::UUID.random_create.to_s
      Thing.create :title =>"New Thing (#{$thing_uuid})", :description =>
      "Description for thing #{$thing_uuid}"
    end

  end

end
```

This worker create `n` number of things, where `n` is the value passed to the worker.

5. Create a controller for “Things” by running:

```
rails g controller Thing
```

Create the controller as follows:

```
class ThingController < ApplicationController

  def new
    ThingWorker.perform_async(2)
    redirect_to '/thing'
  end

  def index
    @things = Thing.all
  end

end
```

6. Add a view to inspect our collection of “Things” by running:

```
mkdir app/views/things
touch app/views/things/index.html.erb
```

Create the view as follows:

```
<%= @things.inspect %>
```

## Deploying the app

You must deploy your example app twice for it to work, once as a Rails web app and once as a standalone Ruby app. One way to do this is to keep separate Cloud Foundry manifests for each app type.

To create separate manifests for each app type:

1. Create a web manifest and save it as `web-manifest.yml`:

```
---
applications:
- name: sidekiq
  memory: 256M
  instances: 1
  host: sidekiq
  domain: ${target-base}
  path: .
  services:
    - sidekiq-mysql:
    - sidekiq-redis:
```

2. Create a worker manifest and save it as `worker-manifest.yml`:

```
---
applications:
- name: sidekiq-worker
  memory: 256M
  instances: 1
  path: .
```

```
command: bundle exec sidekiq
no-route: true
services:
- sidekiq-redis:
- sidekiq-mysql:
```

3. Since the URL `sidekiq.cloudfoundry.com` is likely already taken, change it in `web-manifest.yml` first, then push the app with both manifest files by running:

```
cf push -f web-manifest.yml
cf push -f worker-manifest.yml
```

If the cf CLI asks for a URL for the worker app, select **none**.

## Testing the app

To test the app:

1. Visit the new action on the “Thing” controller at the assigned URL. In this example, the URL would be `http://sidekiq.cloudfoundry.com/thing/new`.

This creates a new Sidekiq job which is queued in Redis, then picked up by the worker app. The browser is then redirected to `/thing`, which shows the collection of “Things”.

## Scale workers

To change the number of Sidekiq workers:

1. Run:

```
cf scale sidekiq-worker -i WORKER-NUMBER
```

Where `WORKER-NUMBER` is the number of Sidekiq workers you want.

## Use `rails_serve_static_assets` on Rails 4

By default, Rails 4 returns a 404 error if an asset is not handled via an external proxy such as Nginx. The `rails_serve_static_assets` gem enables your Rails server to deliver static assets directly, instead of returning a 404 error.

You can use this capability to populate an edge cache CDN or serve files directly from your web app. The gem enables this behavior by setting the `config.serve_static_assets` option to `true`, so you do not need to configure it manually.

## Add custom libraries

If your app requires external shared libraries that are not provided by the rootfs or the buildpack, you must place the libraries in an `ld_library_path` directory at the app root.

You must keep these libraries up-to-date. They do not update automatically.

The Ruby buildpack automatically adds the directory `<app-root>/ld_library_path` to `LD_LIBRARY_PATH` so that your app can access these libraries at runtime.

# Environment variables

You can access environments variable programmatically. For example, you can obtain `VCAP_SERVICES` by running:

```
ENV['VCAP_SERVICES']
```

Environment variables available to you include both those defined by the system and those defined by the Ruby buildpack, as described in the sections below. For more information about system environment variables, see the [App-Specific System Variables](#) section of the *TAS for VMs Environment Variables* topic.

## BUNDLE\_BIN\_PATH

This variable specifies the location where Bundler installs binaries.

For example: `BUNDLE_BIN_PATH:/home/vcap/app/vendor/bundle/ruby/1.9.1/gems/bundler-1.3.2/bin/bundle`

## BUNDLE\_GEMFILE

This variable specifies the path to the app Gemfile.

For example: `BUNDLE_GEMFILE:/home/vcap/app/Gemfile`

## BUNDLE\_WITHOUT

The `BUNDLE_WITHOUT` environment variable instructs Cloud Foundry to skip gem installation in excluded groups.

Use this with Rails apps, where “assets” and “development” gem groups typically contain gems that are not needed when the app runs in production.

For example: `BUNDLE_WITHOUT=assets`

## DATABASE\_URL

Cloud Foundry examines the `database_uri` for bound services to see if they match known database types. If known relational database services are bound to the app, the `DATABASE_URL` environment variable is set using the first match in the list.

If your app depends on `DATABASE_URL` to be set to the connection string for your service and Cloud Foundry does not set it, use the `cf set-env` command to can set this variable manually.

For example:

```
cf set-env my-app-name DATABASE_URL mysql://example-database-connection-string
```

## GEM\_HOME

This variable specifies the location where gems are installed.

For example: `GEM_HOME:/home/vcap/app/vendor/bundle/ruby/1.9.1`

## GEM\_PATH

This variable specifies the location where gems can be found.

For example: `GEM_PATH=/home/vcap/app/vendor/bundle/ruby/1.9.1:`

## RACK\_ENV

This variable specifies the Rack deployment environment. Valid values are `development`, `deployment`, and `none`. This governs which middleware is loaded to run the app.

For example: `RACK_ENV=development`

## RAILS\_ENV

This variable specifies the Rails deployment environment. Valid values are `development`, `test`, and `production`. This controls which of the environment-specific configuration files governs how the app is run.

For example: `RAILS_ENV=production`

## RUBYOPT

This Ruby environment variable defines command-line options passed to Ruby interpreter.

For example: `RUBYOPT: -I/home/vcap/app/vendor/bundle/ruby/1.9.1/gems/bundler-1.3.2/lib -rbundler/setup`

# Getting started deploying Ruby apps

In this section:

- [Getting started deploying Ruby apps](#)
- [Getting started deploying Ruby on Rails apps](#)

## Getting started deploying Ruby apps

Learn how to deploy a Ruby app to Cloud Foundry. If you experience a problem following the steps, check the [Known Issues](#) topic, or refer to the [Troubleshooting application deployment and health](#) topic.

If you want to go through this tutorial using the sample app, run `git clone https://github.com/cloudfoundry-samples/pong_matcher_ruby.git` to clone the `pong_matcher_ruby` app from GitHub, and follow the instructions in the Sample app step sections.

Ensure that your Ruby app runs locally before continuing with this procedure.

## Deploy a Ruby app

You can deploy a Ruby application to Cloud Foundry, and use the output from a sample app to show specific steps of the deployment process.

## Prerequisites

- A Ruby 2.x application that runs locally on your workstation

- Bundler configured on your workstation
- Basic to intermediate Ruby knowledge
- The [Cloud Foundry Command Line Interface \(cf CLI\)](#) installed on your workstation

## Step 1: Create and bind a service instance for a Ruby app

Use the cf CLI to configure a Redis Cloud managed service instance for an app. You can use either the CLI or Apps Manager to perform this task. For more information about using Apps Manager, see [About Apps Manager](#).

Cloud Foundry supports the following types of service instances:

- Managed services integrate with Cloud Foundry through service brokers that offer services and plans and manage the service calls between Cloud Foundry and a service provider.
- User-provided service instances enable you to connect your application to pre-provisioned external service instances.

For more information about creating and using service instances, refer to the [Services Overview](#) topic.

### Creating a service instance

To create a service instance:

1. View managed and user provided services and plans that are available to you by running:

```
cf marketplace
```

The example shows three of the available managed database-as-a-service providers and the plans that they offer: `cleardb MySQL` and `postgresql-10-odb PostgreSQL` as a Service.

```
$ cf marketplace
Getting services from marketplace in org Cloud-Apps / space development
as clouduser@example.com...
OK

service          plans           descripti
on
...
cleardb         spark, boost, amp, shock   Highly av
ailable MySQL for your Apps
...
postgresql-10-odb  standalone, standalone-replica, general  PostgreSQL
as a Service
...
```

2. Create a service instance for your app.

```
cf create-service SERVICE PLAN SERVICE-INSTANCE
```

Choose a `SERVICE` and `PLAN` from the list, and provide a unique name for the `SERVICE-INSTANCE`.



Run `cf create-service rediscloud 30mb redis`. This creates a service instance named `redis` that uses the `rediscloud` service and the `30mb` plan, as the example below shows.

```
$ cf create-service rediscloud 30mb redis
Creating service redis in org Cloud-Apps / space development as clouduser@example.com....
OK
```

### (Optional) Bind a service instance

When you bind an app to a service instance, Cloud Foundry writes information about the service instance to the `VCAP_SERVICES` app environment variable. The app can use this information to integrate with the service instance.

Most services support bindable service instances. Refer to your service provider's documentation to confirm if they support this functionality.

You can bind a service to an application by running:

```
cf bind-service APPLICATION SERVICE-INSTANCE
```

Alternately, you can configure the deployment manifest file by adding a `services` block to the `applications` block and specifying the service instance. For more information and an example on service binding using a manifest, see the [Sample app step](#).

You can also bind a service using Apps Manager. For more information about using Apps Manager, see [Adding and Binding services using Apps Manager](#).

You can skip this step. The `manifest.yml` for the sample app contains a `services` sub-block in the `applications` block, as the example below shows. This binds the `redis` service instance that you created in the previous step.

```
services:
  - redis
```

## (Optional) Step 2: Configure deployment options

### Configure the deployment manifest file

You can specify app deployment options in a manifest that the `cf push` command uses. For more information about application manifests and supported attributes, refer to the [Deploying with Application Manifests](#) topic.

### Configure a production server

Cloud Foundry uses the default standard Ruby web server library, WEBrick, for Ruby and RoR apps. However, Cloud Foundry can support a more robust production web server, such as Phusion Passenger,

Puma, Thin, or Unicorn. If your app requires a more robust web server, refer to the [Configuring a Production Server](#) topic for help configuring a server other than WEBrick.

You can skip this step. The `manifest.yml` file for `pong_matcher_ruby` does not require any additional configuration to deploy the app.

## Step 3: Log in and target the API endpoint

Enter your login credentials, and select a space and org.

```
cf login -a API-ENDPOINT
```

The API endpoint is [the URL of the Cloud Controller](#) in your TAS for VMs instance.



You must do this step to run the sample app.

## Step 4: Deploy an app

You must use the `cf` CLI to deploy apps.

Deploy your application by running the following command from the root directory of your application:

```
cf push APP-NAME
```

This command creates a URL route to your application in the form `HOST.DOMAIN`, where `HOST` is your `APP-NAME` and `DOMAIN` is specified by your administrator. Your `DOMAIN` is `shared-domain.example.com`.

For example, `cf push my-app` creates the URL `my-app.shared-domain.example.com`.

The URL for your app must be unique from other apps that Cloud Foundry hosts or the push fails. Use the following options to help create a unique URL:

- `-n` to assign a different HOST name for the app.
- `--random-route` to create a URL that includes the app name and random words.
- `cf help push` to view other options for this command.

If you want to view log activity while the app deploys, launch a new terminal window and run `cf logs APP-NAME`.

Once your app deploys, browse to your app URL. Search for the `urls` field in the `App started` block in the output of the `cf push` command. Use the URL to access your app online.

Run `cf push pong_matcher_ruby -n HOST_NAME`.

**Example:** `cf push pong_matcher_ruby -n pongmatch-ex12`

The following example shows the terminal output of deploying the `pong_matcher_ruby` app. The `cf push` command uses the instructions in the manifest file to create the app, create and bind the route, and upload the app. It then binds the app to the `redis` service and follows the instructions in the manifest to start one instance of the app with 256M. After the app starts, the output displays the health and status of the app.

These examples work for cf CLI v6. The `-n` flag is not supported for cf CLI v7/v8. Hostname must be set using the `routes` property in the manifest.

The `pong_matcher_ruby` app does not include a web interface. To interact with the `pong_matcher_ruby` app, see the interaction instructions on GitHub: [https://github.com/cloudfoundry-samples/pong\\_matcher\\_ruby](https://github.com/cloudfoundry-samples/pong_matcher_ruby).

```
$ cf push pong_matcher_ruby -n pongmatch-ex12
Using manifest file /Users/clouduser/workspace/pong_matcher_ruby/manifest.yml

Creating app pong_matcher_ruby in org Cloud-Apps / space development as cloud
user@example.com...
OK

Creating route pongmatch-ex12.shared-domain.example.com
      Binding pongmatch-ex12.shared-domain.example.com to pong_matcher_rub
y...
OK

Uploading pong_matcher_ruby...
Uploading app files from: /Users/clouduser/workspace/pong_matcher_ruby
Uploading 8.8K, 12 files
OK
Binding service redis to app pong_matcher_ruby in org Cloud-Apps / space deve
lopment as clouduser@example.com...
OK

Starting app pong_matcher_ruby in org Cloud-Apps / space development as cloud
user@example.com...
OK
...
0 of 1 instances running, 1 starting
1 of 1 instances running

App started

Showing health and status for app pong_matcher_ruby in org Cloud-Apps / space
development as clouduser@example.com...
OK

requested state: started
instances: 1/1
usage: 256M x 1 instances
urls: pongmatch-ex12.cfapps.io

      state      since            cpu      memory          disk
#0  running   2014-12-09 10:04:40 AM  0.0%  35.2M of 256M  45.8M of 1G
```

## Step 5: Test a deployed app

You've deployed an app to Cloud Foundry!

Use the `cf` CLI or [About Apps Manager](#) to review information and administer your app and your account. For example, you could edit the `manifest.yml` to increase the number of app instances from 1 to 3, and redeploy the app with a new app name and host name.

See the [Manage Your Application with the cf CLI](#) section for more information. For more information about using Apps Manager, see [Using Apps Manager](#).

## Manage your application with the cf CLI

Run `cf help` to view a complete list of commands, grouped by task categories, and run `cf help COMMAND` for detailed information about a specific command. For more information about using the cf CLI, refer to the Cloud Foundry Command Line Interface (cf CLI) topics.

You cannot perform certain tasks in the CLI or [About Apps Manager](#) because these are commands that only an administrator can run. If you are not an administrator, the following message displays for these types of commands:

```
error code: 10003, message: You are not authorized to perform the requested action
```

For more information about specific Admin commands you can perform with Apps Manager, depending on your user role, see [Getting started with Apps Manager](#).

## Troubleshooting

If your application fails to start, verify that the application starts in your local environment. Refer to the [Troubleshooting Application Deployment and Health](#) topic to learn more about troubleshooting.

### App deploy fails

Even when deploying an app fails, the app might exist on Cloud Foundry. Run `cf apps` to review the apps in the targeted org and space. You might be able to correct the issue using the CLI or [About Apps Manager](#), or you might have to delete the app and redeploy it.

Common reasons deploying an app fails include:

- You did not successfully create and bind a needed service instance to the app, such as a PostgreSQL service instance. Refer to Step 2: Create and Bind a Service Instance for a Ruby Application.
- You did not successfully create a unique URL for the app. Refer to the troubleshooting tip [App Requires Unique URL](#).

### App requires unique URL

Cloud Foundry requires that each app that you deploy has a unique URL. Otherwise, the new app URL collides with an existing app URL and Cloud Foundry cannot successfully deploy the app. You can fix this issue by running `cf push` with the `--random-route` flag to create a unique URL. Using `--random-route` to create a URL that includes the app name and random words might create a long URL, depending on the number of words that the app name includes.

# Getting started deploying Ruby on Rails apps

You can use this information to deploy a Ruby on Rails app to Cloud Foundry.

## Prerequisites

In order to deploy a sample Ruby on Rails app, you must have the following:

- Cloud Foundry deployment
- [Cloud Foundry Command Line Interface](#)
- Cloud Foundry username and password with **Space Developer** permissions. See your [Org Manager](#) if you require permissions.

## Step 1: Clone the app

Run the following command to create a local copy of the cf-sample-app-rails:

```
git clone https://github.com/cloudfoundry-samples/cf-sample-app-rails.git
```

The newly created directory contains a `manifest.yml` file, which assists CF with deploying the app. See [Deploying with Application Manifests](#) for more information.

## Step 2: Log in and target the API endpoint

1. Run the following terminal command to log in and target the API endpoint of your deployment. For more information, see [Identifying the API Endpoint for Your TAS for VMs Instance](#).

```
cf login -a YOUR-API-ENDPOINT
```

2. Use your credentials to log in, and to select a [Space and Org](#).

## Step 3: Create a service instance

Run the following terminal command to create a PostgreSQL service instance for the sample app.

```
cf create-service postgresql-10-odb standalone rails-postgres
```

For example:

```
$ cf create-service postgresql-10-odb standalone rails-postgres
Creating service rails-postgres in org YOUR-ORG / space development as cloudu
ser@example.com....
OK
```

The service instance is `rails-postgres`. It uses the `postgresql-10-odb` service and the `standalone` plan. For more information about the `postgresql-10-odb` service, see [Crunchy PostgreSQL](#).

## Step 4: Deploy the app

Make sure you are in the `cf-sample-app-rails` directory. Run the following command to deploy the app:

```
cf push cf-sample-app-rails
```

This command creates a URL route to your application in the form `HOST.DOMAIN`. In this example, `HOST` is `cf-sample-app-rails`. Administrators specify the `DOMAIN`.

For example, for the `DOMAIN shared-domain.example.com`, running the previous command creates the URL `cf-sample-app-rails.shared-domain.example.com`.

The following example shows the terminal output when deploying the `cf-sample-app-rails`. `cf push` uses the instructions in the manifest file to create the app, create and bind the route, and upload the app. It then follows the information in the manifest to start one instance of the app with 256M of RAM. After the app starts, the output displays the health and status of the app.

```
$ cf push cf-sample-app-rails
Using manifest file ~/workspace/cf-sample-app-rails/manifest.yml

Creating app cf-sample-app-rails in org my-org / space dev as cloudunder@example.com...
OK

Creating route cf-sample-app-rails.cfapps.io...
OK

Binding cf-sample-app-rails.cfapps.io to cf-sample-app-rails...
OK

Uploading cf-sample-app-rails...
Uploading app files from: ~/workspace/cf-sample-app-rails
Uploading 746.6K, 136 files
Done uploading
OK

Starting app cf-sample-app-rails in org my-org / space dev as cloudunder@example.com...
.
.
.
0 of 1 instances running, 1 starting
1 of 1 instances running

App started

OK

App cf-sample-app-rails was started using this command `bundle exec rails server -p $PORT`

Showing health and status for app cf-sample-app-rails in org my-org / space dev as cloudunder@example.com...
OK
```

```

requested state: started
instances: 1/1
usage: 512M x 1 instances
urls: cf-sample-app-rails.cfapps.io
last uploaded: Wed 17 Jul 22:57:04 UTC 2024
stack: cflinuxfs3
buildpack: ruby

      state  since          cpu    memory      disk   l
oggining      cpu entitlement details
#0  running  2024-07-17T22:57:22Z  0.3%  49.5M of 512M  130.2M of 1G  0
B/s of 16K/s  2.4%

```

If you want to view log activity while the app deploys, launch a new terminal window and run `cf logs cf-sample-app-rails`.

To avoid security exposure, verify that you migrate your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

## Step 5: Bind the service instance

- Run the following command to bind the service instance to the sample app. Once bound, environment variables are stored that allow the app to connect to the service after a `cf push`, `cf restage`, or `cf restart` command.

```
$ cf bind-service cf-sample-app-rails rails-postgres
Binding service rails-postgres to app cf-sample-app-rails in org my-org
/ space dev
OK
TIP: Use 'cf restage cf-sample-app-rails' to ensure your env variable changes take effect
```

- Run the following command to restage the sample app.

```
$ cf restage cf-sample-app-rails
```

- Run the following command to verify the service instance is bound to the sample app.

```
$ cf services
Getting services in org my-org / space dev
OK
      name          service          plan        bound apps
last operation
rails-postgres  postgresql-10-odb  standalone  cf-sample-app-rails
create succeeded
```

## Step 6: Verify the app

Verify that your app is running by browsing to the URL generated in the output of the previous step. In this example, go to `cf-sample-app-rails.shared-domain.example.com` and verify that the app is running.

For more information, see the [Pushing an App](#) topic.

## Test a deployed app

Use the cf CLI or [About Apps Manager](#) to review information and administer your app and your account. For example, you could edit the `manifest.yml` file to increase the number of app instances from 1 to 3 or redeploy the app with a new app name.

## Manage your app with the cf CLI

Run `cf help` to view a complete list of commands and run `cf help COMMAND` for detailed information about a specific command. For more information about using the cf CLI, refer to the cf CLI topics.

## Troubleshooting

If your app fails to start, verify that the app starts in your local environment. Refer to the [Troubleshooting Application Deployment and Health](#) topic to learn more about troubleshooting.

## Configuring Rake Tasks for deployed apps

For Cloud Foundry to automatically invoke a Rake task while a Ruby or Ruby on Rails app is deployed, you must do the following:

- Include the Rake task in your app.
- Configure the application start command using the `command` attribute in the application manifest.

Use the following example to invoke a Rake database migration task at application startup:

- Create a file with the Rake task name and the extension `.rake`, and store it in the `lib/tasks` directory of your application.
- Add the following code to your rake file:

```
namespace :cf do
  desc "Only run on the first application instance"
  task :on_first_instance do
    instance_index = JSON.parse(ENV["VCAP_APPLICATION"]) ["instance_index"]
  rescue nil
    exit(0) unless instance_index == 0
  end
end
```

This Rake task limits an idempotent command to the first instance of a deployed application.

- Add the task to the `manifest.yml` file with the `command` attribute, referencing the idempotent command `rake db:migrate` chained with a start command.

```
applications:
- name: my-rails-app
  command: bundle exec rake cf:on_first_instance db:migrate && rails s -p $PORT
```

# Environment variables defined by the Ruby buildpack

Cloud Foundry provides configuration information to apps through environment variables. You can use additional environment variables that are provided by the Ruby buildpack.

For more information about the standard environment variables, see [TAS for VMs Environment Variables](#).

## Ruby buildpack environment variables

The following table describes the environment variables provided by the Ruby buildpack:

Environment Variable	Description
BUNDLE_BIN_PATH	The directory where Bundler installs binaries. For example: <code>BUNDLE_BIN_PATH:/home/vcap/app/vendor/bundle/ruby/1.9.1/gems/bundler-1.3.2/bin/bundle</code>
BUNDLE_GEMFILE	The path to the Gemfile for the app. For example: <code>BUNDLE_GEMFILE:/home/vcap/app/Gemfile</code>
BUNDLE_WITHOUT	Instructs Cloud Foundry to skip gem installation in excluded groups. Use this with Rails apps, where “assets” and “development” gem groups typically contain gems that are not needed when the app runs in production. For example: <code>BUNDLE_WITHOUT=assets</code>
DATABASE_URL	Cloud Foundry examines the <code>database_uri</code> for bound services to see if they match known database types. If known relational database services are bound to the app, then the <code>DATABASE_URL</code> environment variable is set to the first services in the list. If your app requires that <code>DATABASE_URL</code> is set to the connection string for your service, and Cloud Foundry does not set it, use the Cloud Foundry Command Line Interface (cf CLI) <code>cf set-env</code> command to set this variable manually. For example: <code>cf set-env my-app DATABASE_URL mysql://example-database-connection-string</code>
GEM_HOME	The directory where gems are installed. For example: <code>GEM_HOME:/home/vcap/app/vendor/bundle/ruby/1.9.1</code>
GEM_PATH	The directory where gems can be found. For example: <code>GEM_PATH=/home/vcap/app/vendor/bundle/ruby/1.9.1:</code>
RACK_ENV	The Rack deployment environment, which governs the middleware loaded to run the app. Valid values are <code>development</code> , <code>deployment</code> , and <code>none</code> . For example: <code>RACK_ENV=none</code>
RAILS_ENV	The Rails deployment environment, which controls which environment-specific configuration file governs how the app is run. Valid values are <code>development</code> , <code>test</code> , and <code>production</code> . For example: <code>RAILS_ENV=production</code>
RUBYOPT	Defines command-line options passed to Ruby interpreter. For example: <code>RUBYOPT: -I/home/vcap/app/vendor/bundle/ruby/1.9.1/gems/bundler-1.3.2/lib -rbundler/setup</code>

## Configuring service connections for Ruby

After you create a service instance and bind it to an application, you must configure the application to connect to the service.

## Query VCAP\_SERVICES with cf-app-utils

The `cf-app-utils` gem allows your application to search for credentials from the `VCAP_SERVICES` environment variable by name, tag, or label.

- [cf-app-utils-ruby](#)

## VCAP\_SERVICES defines DATABASE\_URL

At runtime, Cloud Foundry creates a `DATABASE_URL` environment variable for every application based on the `VCAP_SERVICES` environment variable.

Example `VCAP_SERVICES`:

```
VCAP_SERVICES =
{
  "postgresql-10-odb": [
    {
      "name": "postgresql-10-odb-c6c60",
      "label": "postgresql-10-odb",
      "credentials": {
        "uri": "postgres://exampleuser:examplepass@babar.postgresql-10-odb.com:5432/exampledb"
      }
    }
  ]
}
```

Based on this `VCAP_SERVICES`, Cloud Foundry creates the following `DATABASE_URL` environment variable:

```
DATABASE_URL = postgres://exampleuser:examplepass@babar.postgresql-10-odb.com:5432/exampledb
```

Cloud Foundry uses the structure of the `VCAP_SERVICES` environment variable to populate `DATABASE_URL`. Any service containing a JSON object with the following form is recognized by Cloud Foundry as a candidate for `DATABASE_URL`:

```
{
  "some-service": [
    {
      "credentials": {
        "uri": "<some database URL>"
      }
    }
  ]
}
```

Cloud Foundry uses the first candidate found to populate `DATABASE_URL`.

## Configure non Rails apps

Non Rails applications can also access the `DATABASE_URL` variable.

If you have more than one service with credentials, only the first is populated into `DATABASE_URL`. To access other credentials, you can inspect the `VCAP_SERVICES` environment variable.

```
vcap_services = JSON.parse(ENV['VCAP_SERVICES'])
```

Use the hash key for the service to obtain the connection credentials from `VCAP_SERVICES`.

- For services that use the **v2** format, the hash key is the name of the service.
  - For services that use the **v1** format, the hash key is formed by combining the service provider and version, in the format PROVIDER-VERSION.
- For example, the service provider “p-mysql” with version “n/a” forms the hash key `p-mysql-n/a`.

## Seed or migrate database

Before you can use your database the first time, you must create and populate, or migrate it.

For more information about migrating database schemas, see [Services Overview](#).

## Troubleshooting

To aid in troubleshooting issues connecting to your service, you can examine the environment variables and log messages Cloud Foundry records for your application.

### View environment variables

Use the `cf env` command to view the Cloud Foundry environment variables for your application. `cf env` displays the following environment variables:

- The `VCAP_SERVICES` variables existing in the container environment
- The user provided variables set using the `cf set-env` command

```
$ cf env my-app
Getting env variables for app my-app in org My-0rg / space development as adm
in...
OK

System-Provided:
{
  "VCAP_SERVICES": {
    "p-mysql-n/a": [
      {
        "credentials": {
          "uri": "postgres://lrra:e6B-X@p-mysqlprovider.example.com:5432/lra
a
        },
        "label": "p-mysql-n/a",
        "name": "p-mysql",
        "syslog_drain_url": "",
        "tags": ["postgres", "postgresql", "relational"]
      }
    ]
  }
}

User-Provided:
```

```
my-env-var: 100
my-drain: http://drain.example.com
```

## View logs

Use the `cf logs` command to view the Cloud Foundry log messages for your application. You can direct current logging to standard output, or you can dump the most recent logs to standard output.

Run `cf logs APPNAME` to direct current logging to standard output:

```
$ cf logs my-app
Connected, tailing logs for app my-app in org My-Org / space development as a
dmin...
1:27:19.72 [App/0]  OUT [CONTAINER]  org.apache.coyote.http11.Http11Protocol
INFO  Starting ProtocolHandler ["http-bio-61013"]
1:27:19.77 [App/0]  OUT [CONTAINER]  org.apache.catalina.startup.Catalina
INFO  Server startup in 10427 ms
```

Run `cf logs APPNAME --recent` to dump the most recent logs to standard output:

```
$ cf logs my-app --recent
Connected, dumping recent logs for app my-app in org My-Org / space development as admin...
1:27:15.93 [App/0]  OUT 15,935  INFO EmbeddedDatabaseFactory:124 - Creating e
mbedded database 'SkyNet'
1:27:16.31 [App/0]  OUT 16,318  INFO LocalEntityManagerFactory:287 - Building
TM container EntityManagerFactory for unit 'default'
1:27:16.50 [App/0]  OUT 16,505  INFO Version:37 - HCANN001: Hibernate Commons
Annotations {4.0.1.Final}
1:27:16.51 [App/0]  OUT 16,517  INFO Version:41 - HHH412: Hibernate Core {4.
1.9.Final}
1:27:16.95 [App/0]  OUT 16,957  INFO SkyNet-Online:73 - HHH268: Transaction s
trategy: org.hibernate.internal.TransactionFactory
1:27:16.96 [App/0]  OUT 16,963  INFO InitiateTerminatorT1000Deployment:48 -
HHH000397: Using TranslatorFactory
1:27:17.02 [App/0]  OUT 17,026  INFO Version:27 - HV001: Hibernate Validator
4.3.0.Final
```

If you encounter the error, “A fatal error has occurred. Please see the Bundler troubleshooting documentation,” update your version of bundler and run `bundle install`.

```
$ gem update bundler
$ gem update --system
$ bundle install
```

## Support for Windows Gemfiles

Learn how you can handle Ruby buildpack dependencies on Microsoft Windows machines.

### Windows Gemfiles

When a `Gemfile.lock` is generated on a Windows machine, it often contains gems with Windows specific versions. This results in versions of gems such as `mysql2`, `thin`, and `pg` containing “`-x86-mingw32`.” For example, the `Gemfile` might contain the following:

```
gem 'sinatra'
gem 'mysql2'
gem 'json'
```

When you run `bundle install` with `Gemfile` on a Windows machine, it results in the following `Gemfile.lock`:

```
GEM remote: http://rubygems.org/
specs:
  json (1.7.3)
  mysql2 (0.3.11-x86-mingw32)
  rack (1.4.1)
  rack-protection (1.2.0)
  rack sinatra (1.3.2)
  rack (~> 1.3, >= 1.3.6)
  rack-protection (~> 1.2)
  tilt (~> 1.3, >= 1.3.3)
  tilt (1.3.3)
PLATFORMS x86-mingw32
DEPENDENCIES
  json
  mysql2
  sinatra
```

Notice the “`-x86-mingw32`” in the version number of `mysql2`. Since Cloud Foundry runs on Linux machines, this fails to install. To mitigate this, the Ruby Buildpack removes the `Gemfile.lock` and uses Bundler to resolve dependencies from the `Gemfile`.



Removing the `Gemfile.lock` causes dependency versions to be resolved from the `Gemfile`. This could result in different versions being installed than those listed in the `Gemfile.lock`.

## Staticfile buildpack

You can configure and use the Staticfile buildpack in Cloud Foundry.

**Staticfile app:** An app or content that requires no backend code other than the NGINX webserver, which the buildpack provides. Examples of staticfile apps are front-end JavaScript apps, static HTML content, and HTML/JavaScript forms.

**Staticfile buildpack:** The buildpack that provides runtime support for staticfile apps and apps with back ends hosted elsewhere. To find which version of NGINX the current Staticfile buildpack uses, see [Staticfile buildpack release notes](#).

## Staticfile detection

If you create a file named `Staticfile` and locate it in the build directory of your app, Cloud Foundry automatically uses the Staticfile buildpack when you push your app.

The `Staticfile` file can be an empty file, or it can contain configuration settings for your app. For more information, see [Configuring the buildpack](#) and [Pushing an App](#).

## Memory usage

NGINX requires 20 MB of RAM to serve static assets. When using the Staticfile buildpack, VMware push the apps with the `-m 64M` option to reduce RAM allocation from the default 1 GB that are allocated to containers by default.

## Configure the buildpack

This section describes configuration options that are available for the Staticfile buildpack. If you need to make configuration changes to NGINX that are not listed in the table, use the NGINX buildpack instead of the Staticfile buildpack. For more information, see [NGINX buildpack](#).

### Staticfile file configuration

To configure these options, add the configuration property as a new line in your `Staticfile` file as described in the following table:

Staticfile configuration property	Description
<code>root: YOUR-DIRECTORY-NAME</code>  Example: <code>root: public</code>	<b>Alternative root:</b> Specifies a root directory other than the default. Use this option to serve <code>index.html</code> and other assets, such as HTML, CSS, or JavaScript files, from a location other than the root directory.  For example, you can specify an alternate folder, <code>dist</code> or <code>public</code> .
<code>directory: visible</code>	<b>Directory list:</b> Displays an HTML page that shows a directory index for your site.  If your site is missing an <code>index.html</code> file, your app displays a directory list instead of the standard 404 error page.
<code>ssi: enabled</code>	<b>SSI:</b> Activates Server Side Includes (SSI). You can embed the contents of one or more files into a web page on a web server. For general information about SSI, see <a href="#">Server Side Includes</a> entry on Wikipedia.
<code>pushstate: enabled</code>	<b>Pushstate routing:</b> Keeps browser-visible URLs clean for client-side JavaScript apps that serve multiple routes. For example, pushState routing allows a single JavaScript file to route to multiple anchor tagged URLs that look like <code>/some/path1</code> instead of <code>/some#path1</code> .
<code>gzip: off</code>	<b>GZip file serving and compression:</b> Deactivate <code>gzip_static</code> and <code>gunzip</code> modules are activated by default. With these modules you can use NGINX to serve files stored in compressed GZ format and to decompress them for clients that do not support compressed content or responses.  You might want to deactivate compression under certain circumstances. For example, when you serve content to very old browser clients.

Staticfile configuration property	Description
<code>http_proxy: HTTP-URL</code> <code>https_proxy: HTTPS-URL</code>	<b>Proxy support:</b> You can use a proxy when downloading dependencies during the staging of your app.
<b>Example:</b> <pre>http_proxy: http://www.example.com/ https_proxy: https://www.example.com/</pre>	
<code>enable_http2: true</code>	<b>Enable HTTP/2:</b> Serve requests over HTTP/2 instead of HTTP/1.1. This deactivates serving HTTP/1.1 traffic.  Alternatively, set the <code>ENABLE_HTTP2</code> environment variable to <code>true</code> .
<code>force_https: true</code>	<b>Force HTTPS:</b> Forces all requests to be sent through HTTPS. This redirects non-HTTPS requests as HTTPS requests.  Alternatively, you can set the <code>FORCE_HTTPS</code> environment variable to <code>true</code> .
	 Do not activate <code>FORCE_HTTPS</code> if you have a proxy server or load balancer loops. For example, if you use <a href="#">Flexible SSL</a> with CloudFlare.
<code>host_dot_files: true</code>	<b>Dot files:</b> By default, hidden files, which start with a <code>.</code> , are not served by this buildpack.
<code>status_codes:</code> <code>404: /404.html</code> <code>500: /500.html</code>	<b>Status Codes:</b> You can define custom pages for HTTP STATUS codes instead of the default NGINX pages.
<code>http_strict_transport_security:</code> <code>true</code>	<b>HTTP Strict Transport Security (HSTS):</b> Causes NGINX to respond to all requests with the header <code>Strict-Transport-Security: max-age=31536000</code> . This forces receiving browsers to make all subsequent requests over HTTPS. This setting defaults to a <code>max-age</code> of one year.   This setting persists in browsers for a long time, so you must enable this setting only <i>after</i> you ensure that you have completed your app configuration.
<code>http_strict_transport_security_include_subdomains: true</code>	<b>HSTS includes subdomains:</b> Causes NGINX to respond to all requests with the following header: <code>Strict-Transport-Security: max-age=31536000; includeSubDomains</code>  This forces browsers to make all subsequent requests over HTTPS including subdomains. This setting defaults to a <code>max-age</code> of one year.   Setting this property to <code>true</code> also makes <code>http_strict_transport_security</code> default to true.

Staticfile configuration property	Description
<code>http_strict_transport_security_preload: true</code>	<p><b>HSTS preload:</b> Causes NGINX to respond to all requests with the following header: <code>Strict-Transport-Security: max-age=31536000; includeSubDomains; preload</code></p> <p>This forces browsers to make all subsequent requests over HTTPS including subdomains and requests inclusion in browser-managed HSTS preload lists. For more information, see <a href="https://hstspreload.org">https://hstspreload.org</a>. This setting defaults to a <code>max-age</code> of one year.</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;">  Setting this property to <code>true</code> also makes <code>http_strict_transport_security</code> and <code>http_strict_transport_security_include_subdomains</code> default to true.       </div>

## Other configuration changes

Use the following instructions to make other configuration changes.

### Basic authentication

You can enable basic authentication for your app or website. You can create a hashed username and password pair for each user by using a site like [Htpasswd Generator](#).

#### Configuration

Add a new `Staticfile.auth` file to the root or alternative root directory. In the new file, add one or more username and password entries using the following format: `USERNAME:HASHED_PASSWORD`

Example:

```
pat:$example1$DuUQEOp8$ZccZCHQE1NSjrgewSFC0
stevie:$example1$22derfaecZSJRW4rKE$KREWKS
```

### Custom location

You can specify custom location definitions with additional directives. For information about NGINX directives, see [Creating NGINX Plus and NGINX Configuration Files](#) and [Alphabetical index of directives](#) in the *NGINX documentation*.

#### Configuration

To customize the `location` block of the NGINX configuration file:

1. Set an alternative `root` directory. The `location_include` property only works in conjunction with an alternative `root`. See the following example that includes a static content file:
  - **Directory:** `public`
  - **File:** `public/index.html`
2. Create a file with location-scoped NGINX directives. See the following example, which causes visitors of your site to receive the `X-MySiteName` HTTP header:

- **File:** `nginx/conf/includes/custom_header.conf`
  - **Content:** `add_header X-MySiteName BestSiteEver;`
3. Set the `location_include` variable in your **Staticfile** to the path of the file from the previous step. This path is relative to `nginx/conf`.

Example:

```
...
root: public
location_include: includes/*.conf
...
```

## Additional MIME type support

You can configure additional MIME types on your NGINX server.

### Configuration

To add MIME types, add a `mime.types` file to your root folder, or to the alternate root folder, if you specified one.

For more information about the `mime.types` file, see `mime.types` in the *NGINX documentation*.

Example MIME types file:

```
types {
  text/html      html htm shtml;
  text/css       css;
  text/xml       xml rss;
  image/gif     gif;
  ...
}
```

## Push an app

To push your app, you can use either the system Staticfile buildpack or specify a Staticfile buildpack.

### Option 1: Use the system Staticfile buildpack

To use the Staticfile buildpack installed in your deployment, run the following command in the root directory of the app. The root directory of the app must contain a file named `Staticfile`.

```
cf push APP-NAME
```

Where `APP-NAME` is the name you want to give your app.

### Option 2: Specify a Staticfile buildpack

To explicitly specify a Staticfile buildpack, run the following command in the root directory of the app. You might want to specify a buildpack if your deployment does not have the Staticfile buildpack installed or the installed version is outdated.

```
cf push APP-NAME -b BUILDPACK-NAME-OR-PATH
```

Where:

- `APP-NAME` is the name you want to give your app.
- `BUILDPACK-NAME-OR-PATH` is either the name of a buildpack that is installed in your deployment or the path to a buildpack. You can find the Cloud Foundry Staticfile buildpack in the [Staticfile repository](#) on GitHub.

## Verifying the push

After you push the app, follow these steps to verify that the push was successful:

1. Find the URL of your app in the output of the `cf push` command. For example, the URL in the terminal output above is `my-app.example.com`.
2. In a browser, go to the URL to view your app.

## Example Staticfile buildpack apps

For different examples of apps that use the Staticfile buildpack, see the `fixtures` directory in the Staticfile buildpack GitHub repo.

## Help and support

A number of channels exist where you can get more help when using the Staticfile buildpack, or with developing your own Staticfile buildpack.

- **Staticfile Buildpack Repository in GitHub:** Find more information about using and extending the Staticfile buildpack in [GitHub repository](#).
- **Release Notes:** Find current information about this buildpack on the Staticfile buildpack [release page](#) in GitHub.
- **Slack:** Join the `#buildpacks` channel in the [Cloud Foundry Slack community](#).

## Commercial buildpacks

In this section:

- [Java](#)
- [Kerberos](#)

## Overview

This topic describes commercial buildpacks supported by VMware Tanzu Application Service for VMs (TAS for VMs).

Commercial buildpacks are of the following types:

- Cloud Foundry Buildpacks

The following table lists the commercial buildpacks available for TAS for VMs:

Name	Supported languages, frameworks, and technologies	Type
.NET Core	.NET Core	Cloud Foundry
Binary	Binary	Cloud Foundry
Go	Go	Cloud Foundry
HWC	HWC	Cloud Foundry
Java	Java, Spring, Spring Boot, Grails, Play, etc.	Cloud Foundry
Kerberos	Kerberos	Cloud Foundry
NGINX	NGINX	Cloud Foundry
Node.js	Node.js	Cloud Foundry
PHP	PHP	Cloud Foundry
Python	Python	Cloud Foundry
R	R	Cloud Foundry
Ruby	Ruby	Cloud Foundry
Staticfile	Staticfile	Cloud Foundry

## Cloud Foundry Buildpacks

Commercial Cloud Foundry buildpacks are v2 buildpacks as described in [buildpacks.io](#), originally written to run on Cloud Foundry.

Some are commercial versions of open-source buildpacks listed in [CF Buildpack Languages and Sources](#).

## Java Buildpack

Java Buildpack v4.72.0 and later is a commercial version of the open source Java buildpack described in the [java-buildpack repository](#) in the Cloud Foundry github org. See that page for how to install and use the open-source Java buildpack.

This commercial version has the additional features described in the Release Notes below.

Name	Supported Languages, Frameworks, and Technologies	Commercial Versions
Java Buildpack	Java & Spring based applications	4.83.0, 4.82.0, 4.81.0, 4.80.0, 4.79.0, 4.75.0, 4.74.0, 4.73.0, 4.72.0

# Release New Features

## Java Buildpack v4.83.0

This release includes dependency updates, including for JProfiler, Splunk OpenTelemetry, AppDynamics & Ruby (3.2.8)

## Java Buildpack v4.82.0

This release includes dependency updates, including for Tomcat 9 & 10.1 and the latest Java patch releases.

### Application Compliance Verification

This feature allows operators to control Spring Boot applications that have Spring dependencies that have passed their Commercial Support Date (EOL). The default behavior logs a warning message during application staging, indicating the dependency, version, and the EOL date that has passed.

Operators can choose to block these applications from staging by setting the following environment variable:

```
JBP_CONFIG_VERIFY_COMPLIANCE: '{ staging_disabled: true }'
```

This causes applications with EOL dependency versions to fail during staging, and developers must upgrade to supported versions and redeploy. Commercial support dates for Spring projects can be found at <https://api.spring.io/projects>.

As with other buildpack variables, operators can enable the above setting platform-wide, using the prefix `JBP_DEFAULT_VERIFY_COMPLIANCE`.

The initial release of this feature supports verifying the Spring Boot dependency version, support for other Spring Framework dependencies may be added in the future.

## Java Buildpack v4.81.0

This release includes a bumped AppDynamics agent version, 25.2.0 and a change which adds `keepAlive` settings to the default `server.xml` for the buildpack-supplied Tomcat.

## Java Buildpack v4.80.0

This release includes dependency updates, notably a fixed AppDynamics agent version, 24.11, which addresses a runtime error when using Java Flight Recorder with the agent in an application.

## Java Buildpack v4.79.0



v4.79.0 is the next valid release after v4.75.0. Do not use v4.78, v4.77, or v4.76, which contained bugs or were not released.

This release contains improvements to the Spring Boot Efficiency feature introduced in v4.72.0. Spring Boot Applications > 3.3 can now be optimized by the buildpack itself during staging, by enabling the

following variables:

```
JBP_CONFIG_SPRING_BOOT_EFFICIENCY: '{ "aot_enabled": true, "cds_enabled": true }'
```

Setting `aot_enabled: true` configures automated AOT performance enhancements for your Spring apps running on Tanzu Platform to convert the application's layout to an optimized structure, and perform AOT optimizations on the application during staging, unless the application was already AOT optimized during maven or gradle build.

Setting `cds_enabled: true` instructs the JVM to run the application in a `training-run` mode, which creates an archive of classes that enables faster application startup at runtime.

---

This release contains the January Java patch release versions of JREs 8, 11, 17 & 21.

This release also contains dependency updates including a versions of Apache Tomcat 9 & 10.1 with fixes for [CVE-2024-52318](#)

## Java Buildpack v4.75.0

This release contains dependency updates including a versions of Apache Tomcat 9 & 10.1 with fixes for [CVE-2024-56337](#).

Download from Broadcom Support: [Java Buildpack v4.75.0 files](#)

## Java Buildpack v4.74.0

This release contains Performance versions of the online and offline buildpacks. You can download these from Broadcom Support alongside the regular [Java Buildpack v4.74.0 files](#).

### Performance JREs

Differences between Performance and regular Java Buildpack versions:

- JREs 8 & 11 are the Performance Edition versions provided by BellSoft, which harness the power of JRE 17. For details, see [Liberica JDK Performance Edition](#) on the BellSoft website.
- JRE 17 & 21 are the same standard edition JREs as in the regular Java Buildpack and are provided for convenience.

A warning will be printed if you choose JRE 17 or 21 with this buildpack, which simply notes that these are not performance versions.

To use the performance buildpack, download the zip file from the Support Portal, and upload it to the platform using `cf create-buildpack`

## Java Buildpack v4.72.0

### Spring Boot Efficiency

Spring Boot Efficiency is a new Java Buildpack container that stages your application in `training-run` mode, which creates a cache of classes that makes startup time faster.

The feature is supported for [Spring Boot 3.3.0+](#) applications, and takes advantage of the JVM feature Class Data Sharing (CDS) and Spring framework support.

To enable this feature, set the following environment variable:

- `cf set-env <app> JBP_CONFIG_SPRING_BOOT_EFFICIENCY '{ cds_enabled: true }'`

If your app has been built with Ahead-of-Time (AOT) processing, you can additionally enable the AOT flag in the same variable for further improvement in startup time:

- `cf set-env <app> JBP_CONFIG_SPRING_BOOT_EFFICIENCY '{ aot_enabled: true, cds_enabled: true }'`

The feature works as follows:

- When Spring Boot Efficiency is enabled, the buildpack runs your application during staging in a ‘training run’ mode, which generates a CDS archive.
  - The runtime command is then configured to use this archive, providing a faster application startup time.
  - To enable the creation of this archive, set the following environment variable:  
`cf set-env <app> JBP_CONFIG_SPRING_BOOT_EFFICIENCY '{ cds_enabled: true }'`
- If your application has been built with Ahead-of-Time (AOT) processing, you can additionally enable the following AOT flag in the same variable for a further improvement in startup time:  
`cf set-env <app> JBP_CONFIG_SPRING_BOOT_EFFICIENCY '{ aot_enabled: true, cds_enabled: true }'`
- For advanced configuration of the Java arguments that are passed to the ‘training-run’ during staging, you can also set the following option:  
`cf set-env <app> JBP_CONFIG_SPRING_BOOT_EFFICIENCY '{ cds_training_opts: "<args>", cds_enabled: true }'`
- Custom training-run options should not be combined with enabling the AOT efficiency option ('aot-enabled: true').
  - This is because the AOT classes used during training run won’t be compatible with a different set of JAVA\_TOOL\_OPTIONS at runtime; see [Spring Integration listeners fail after devtools restart](#).



Since Spring Boot 3.0+ applications require Java 17, you must enable at least this JRE version when pushing your app.

## Java Buildpack v4.71.0 and Earlier

Java Buildpack release notes for v4.71.0 and earlier are in the [java-buildpack repository](#) in the Cloud Foundry github org.

## Release Dependency Versions

### Java Buildpack v4.83.0

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	<a href="#">25.6.0_37159</a>		<a href="#">Release Notes</a>
Azure Application Insights Agent	<a href="#">3.7.3</a>		<a href="#">Release Notes</a>

Dependency	Version	CVEs	Release Notes
CA Introscope APM Framework	25.5.1_11		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0_RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.19.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.50.1		<a href="#">Release Notes</a>
Elastic APM Agent	1.54.0		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.13		<a href="#">Release Notes</a>
Java CFEnv	3.4.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	15.0.2		<a href="#">ChangeLog</a>
JRebel Agent	2025.3.0		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.22.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.17.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.27_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.15_10	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.7_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_452	Risk Matrix	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.7		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		
SeaLights Agent	4.0.2570		
SkyWalking	9.4.0		<a href="#">ChangeLog</a>

Dependency	Version	CVEs	Release Notes
Splunk OpenTelemetry Java Agent	2.17.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0 RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0 RELEASE	Included inline above	Included inline above
Spring Kit CLI	0.4.0		
Takipi Agent	4.82.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.41	Security	<a href="#">ChangeLog</a>
Tomcat 9	9.0.105	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0 RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0 RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0 RELEASE	Included inline above	Included inline above
YourKit Profiler	2025.3.151		<a href="#">Release Notes</a>

## Java Buildpack v4.82.0

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	25.2.0_36823		<a href="#">Release Notes</a>
Azure Application Insights Agent	3.7.2		<a href="#">Release Notes</a>
CA Introscope APM Framework	25.5.1_11		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0 RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.16.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.49.0		<a href="#">Release Notes</a>
Elastic APM Agent	1.53.0		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.13		<a href="#">Release Notes</a>
Java CFEnv	3.4.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>

Dependency	Version	CVEs	Release Notes
JRebel Agent	2025.2.1		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.20.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.15.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.27_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.15_10	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.7_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_452	Risk Matrix	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.5		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		
SeaLights Agent	4.0.2570		
SkyWalking	9.4.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.10.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
Spring Kit CLI	0.4.0		
Takipi Agent	4.73.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.41	Security	<a href="#">ChangeLog</a>
Tomcat 9	9.0.105	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2025.3.135		<a href="#">Release Notes</a>

## Java Buildpack v4.81.0

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	25.2.0_36823		<a href="#">Release Notes</a>

Dependency	Version	CVEs	Release Notes
Azure Application Insights Agent	3.7.1		<a href="#">Release Notes</a>
CA Introscope APM Framework	24.9.1_19		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0_RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.16.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.47.3		<a href="#">Release Notes</a>
Elastic APM Agent	1.53.0		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.13		<a href="#">Release Notes</a>
Java CFEnv	3.4.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>
JRebel Agent	2025.2.0		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.19.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.14.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.26_9	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.14_10	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.6_10	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_442	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.5		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		
SeaLights Agent	4.0.2570		

Dependency	Version	CVEs	Release Notes
SkyWalking	9.4.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.10.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
Spring Kit CLI	0.4.0		
Takipi Agent	4.73.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.39	Security	<a href="#">ChangeLog</a>
Tomcat 9	9.0.102	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2025.3.134		<a href="#">Release Notes</a>

## Java Buildpack v4.80.0

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	24.11.0_36469		<a href="#">Release Notes</a>
Azure Application Insights Agent	3.7.1		<a href="#">Release Notes</a>
CA Introscope APM Framework	24.9.1_19		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0_RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.15.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.47.1		<a href="#">Release Notes</a>
Elastic APM Agent	1.52.2		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.12		<a href="#">Release Notes</a>
Java CFEvn	3.3.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		

Dependency	Version	CVEs	Release Notes
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>
JRebel Agent	2025.1.2		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.19.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.13.3		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.26_9	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.14_10	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.6_10	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_442	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.5		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		
SeaLights Agent	4.0.2570		
SkyWalking	9.4.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.10.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
Spring Kit CLI	0.4.0		
TakipiAgent	4.73.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.39	<a href="#">Security</a>	<a href="#">ChangeLog</a>
Tomcat 9	9.0.102	<a href="#">Security</a>	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2024.9.164		<a href="#">Release Notes</a>

## Java Buildpack v4.79.0

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	24.8.1_36301		<a href="#">Release Notes</a>
Azure Application Insights Agent	3.7.0		<a href="#">Release Notes</a>
CA Introscope APM Framework	24.9.1_19		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0_RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.14.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.46.0		<a href="#">Release Notes</a>
Elastic APM Agent	1.52.1		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.12		<a href="#">Release Notes</a>
Java CFEnv	3.3.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>
JRebel Agent	2025.1.1		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.18.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.12.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.26_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.14_10	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.6_10	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_442	Risk Matrix	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.5		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		

Dependency	Version	CVEs	Release Notes
SeaLights Agent	4.0.2570		
SkyWalking	9.3.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.10.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
Spring Kit CLI	0.4.0		
TakipiAgent	4.73.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.35	Security	<a href="#">ChangeLog</a>
Tomcat 9	9.0.100	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2024.9.164		<a href="#">Release Notes</a>

## Java Buildpack v4.75.0

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	24.8.1_36301		<a href="#">Release Notes</a>
Azure Application Insights Agent	3.6.2		<a href="#">Release Notes</a>
CA Introscope APM Framework	24.9.1_19		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0_RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.13.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.45.0		<a href="#">Release Notes</a>
Elastic APM Agent	1.52.1		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.12		<a href="#">Release Notes</a>
Java CFEvn	3.3.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		

Dependency	Version	CVEs	Release Notes
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>
JRebel Agent	2024.4.2		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.17.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.11.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.25_11	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.13_12	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.5_11	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_432	Risk Matrix	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.4		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		
SeaLights Agent	4.0.2570		
SkyWalking	9.3.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.10.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
TakipiAgent	4.73.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.34	Security	<a href="#">ChangeLog</a>
Tomcat 9	9.0.96	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2024.9.162		<a href="#">Release Notes</a>

## Java Buildpack v4.74.0

This release contains dependency bumps including:

- Usage of <https://storage.googleapis.com/java-buildpack-dependencies/> new GCS bucket for dependencies
- Java updates

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	<a href="#">24.8.1_36301</a>		<a href="#">Release Notes</a>
Azure Application Insights Agent	<a href="#">3.6.1</a>		<a href="#">Release Notes</a>
CA Introscope APM Framework	<a href="#">24.9.1_19</a>		
Client Certificate Mapper	<a href="#">2.0.1</a>	Included inline above	Included inline above
Container Security Provider	<a href="#">1.20.0_RELEASE</a>	Included inline above	Included inline above
Contrast Security Agent	<a href="#">6.11.1</a>		<a href="#">Release Notes</a>
Datadog APM Javaagent	<a href="#">1.41.1</a>		<a href="#">Release Notes</a>
Elastic APM Agent	<a href="#">1.52.0</a>		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	<a href="#">7.4.0</a>		<a href="#">Release Notes</a>
Geode Tomcat Session Store	<a href="#">2.0.3</a>		
Google Stackdriver Profiler	<a href="#">0.1.0</a>		<a href="#">Release Notes</a>
Groovy	<a href="#">2.5.23</a>		<a href="#">Release Notes</a>
JaCoCo Agent	<a href="#">0.8.12</a>		<a href="#">Release Notes</a>
Java CFEnv	<a href="#">3.2.0</a>		<a href="#">Release Notes</a>
Java Memory Assistant Agent	<a href="#">0.5.0</a>		
Java Memory Assistant Clean Up	<a href="#">0.1.0</a>		
JProfiler Profiler	<a href="#">13.0.7</a>		<a href="#">ChangeLog</a>
JRebel Agent	<a href="#">2024.4.0</a>		<a href="#">ChangeLog</a>
jvmkill Agent	<a href="#">1.17.0_RELEASE</a>	Included inline above	Included inline above
MariaDB JDBC Driver	<a href="#">2.7.9</a>		<a href="#">Release Notes</a>
Memory Calculator	<a href="#">3.13.0_RELEASE</a>	Included inline above	Included inline above
Metric Writer	<a href="#">3.5.0_RELEASE</a>	Included inline above	Included inline above
New Relic Agent	<a href="#">8.15.0</a>		<a href="#">Release Notes</a>
Open Telemetry Agent	<a href="#">2.9.0</a>		<a href="#">Release Notes</a>
OpenJDK JRE 11	<a href="#">11.0.25_11</a>	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 17	<a href="#">17.0.13_12</a>	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 21	<a href="#">21.0.5_11</a>	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 8	<a href="#">1.8.0_432</a>	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	<a href="#">42.7.4</a>		<a href="#">ChangeLog</a>

Dependency	Version	CVEs	Release Notes
Redis Session Store	<a href="#">1.3.6_RELEASE</a>	Included inline above	Included inline above
Riverbed Appinternals Agent	<a href="#">11.8.5_BL527</a>		
SeaLights Agent	<a href="#">4.0.2561</a>		
SkyWalking	<a href="#">9.3.0</a>		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	<a href="#">2.9.0</a>		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	<a href="#">2.12.0_RELEASE</a>	Included inline above	Included inline above
Spring Boot CLI	<a href="#">2.7.18</a>		
Spring Boot Container Customizer	<a href="#">2.6.0_RELEASE</a>	Included inline above	Included inline above
TakipiAgent	<a href="#">4.73.3</a>		<a href="#">Release Notes</a>
Tomcat 10.1	<a href="#">10.1.31</a>	Security	<a href="#">ChangeLog</a>
Tomcat 9	<a href="#">9.0.96</a>	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	<a href="#">3.4.0_RELEASE</a>	Included inline above	Included inline above
Tomcat Lifecycle Support	<a href="#">3.4.0_RELEASE</a>	Included inline above	Included inline above
Tomcat Logging Support	<a href="#">3.4.0_RELEASE</a>	Included inline above	Included inline above
YourKit Profiler	<a href="#">2024.9.158</a>		<a href="#">Release Notes</a>

## Java Buildpack v4.73.0

This release contains dependency bumps including:

- an upgrade of the Ruby dependency from 3.1 to [3.2](#)
- a major version upgrade of the Tomcat Geode Session Store library - to support the latest Gemfire/PCC tile

This release also restores Tomcat 10.1.x which was incorrectly removed in 4.72.0.

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	<a href="#">24.7.0_36185</a>		<a href="#">Release Notes</a>
Azure Application Insights Agent	<a href="#">3.5.4</a>		<a href="#">Release Notes</a>
CA Introscope APM Framework	<a href="#">24.9.1_19</a>		
Client Certificate Mapper	<a href="#">2.0.1</a>	Included inline above	Included inline above
Container Security Provider	<a href="#">1.20.0_RELEASE</a>	Included inline above	Included inline above
Contrast Security Agent	<a href="#">6.9.0</a>		<a href="#">Release Notes</a>
Datadog APM Javaagent	<a href="#">1.39.0</a>		<a href="#">Release Notes</a>
Elastic APM Agent	<a href="#">1.51.0</a>		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	<a href="#">7.4.0</a>		<a href="#">Release Notes</a>

Dependency	Version	CVEs	Release Notes
Geode Tomcat Session Store	2.0.3		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.12		<a href="#">Release Notes</a>
Java CFEnv	3.2.0		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>
JRebel Agent	2024.3.2		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.14.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.8.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.24_9	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.12_10	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.4_9	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_422	<a href="#">Risk Matrix</a>	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.4		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
Riverbed Appinternals Agent	11.8.5_BL527		
SeaLights Agent	4.0.2549		
SkyWalking	9.3.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.7.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
Takipi Agent	4.73.3		<a href="#">Release Notes</a>
Tomcat 10.1	10.1.30	<a href="#">Security</a>	<a href="#">ChangeLog</a>
Tomcat 9	9.0.95	<a href="#">Security</a>	<a href="#">ChangeLog</a>

Dependency	Version	CVEs	Release Notes
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2024.3.161		<a href="#">Release Notes</a>

## Java Buildpack v4.72.0

The Java Buildpack v4.72.0 adds a Spring Boot Efficiency feature and some dependency updates to the Cloud Foundry Java Buildpack.

This release contains a new feature - Spring Boot Efficiency. Spring Boot Efficiency is a new Java Buildpack ‘container’ which runs your application in a ‘training-run’ mode during staging, to create a cache of classes that allow a faster startup time at runtime.

See the [New Features](#) section for more details.

### Dependency Updates

Dependency	Version	CVEs	Release Notes
AppDynamics Agent	24.7.0_36185		<a href="#">Release Notes</a>
Azure Application Insights Agent	3.5.4		<a href="#">Release Notes</a>
CA Introscope APM Framework	24.4.2_8		
Client Certificate Mapper	2.0.1	Included inline above	Included inline above
Container Security Provider	1.20.0_RELEASE	Included inline above	Included inline above
Contrast Security Agent	6.6.0		<a href="#">Release Notes</a>
Datadog APM Javaagent	1.38.0		<a href="#">Release Notes</a>
Elastic APM Agent	1.51.0		<a href="#">Release Notes</a>
Gemalto Luna Security Provider	7.4.0		<a href="#">Release Notes</a>
Geode Tomcat Session Store	1.14.9		
Google Stackdriver Profiler	0.1.0		<a href="#">Release Notes</a>
Groovy	2.5.23		<a href="#">Release Notes</a>
JaCoCo Agent	0.8.12		<a href="#">Release Notes</a>
Java CFEvN	3.1.5		<a href="#">Release Notes</a>
Java Memory Assistant Agent	0.5.0		
Java Memory Assistant Clean Up	0.1.0		
JProfiler Profiler	13.0.7		<a href="#">ChangeLog</a>
JRebel Agent	2024.3.1		<a href="#">ChangeLog</a>
jvmkill Agent	1.17.0_RELEASE	Included inline above	Included inline above

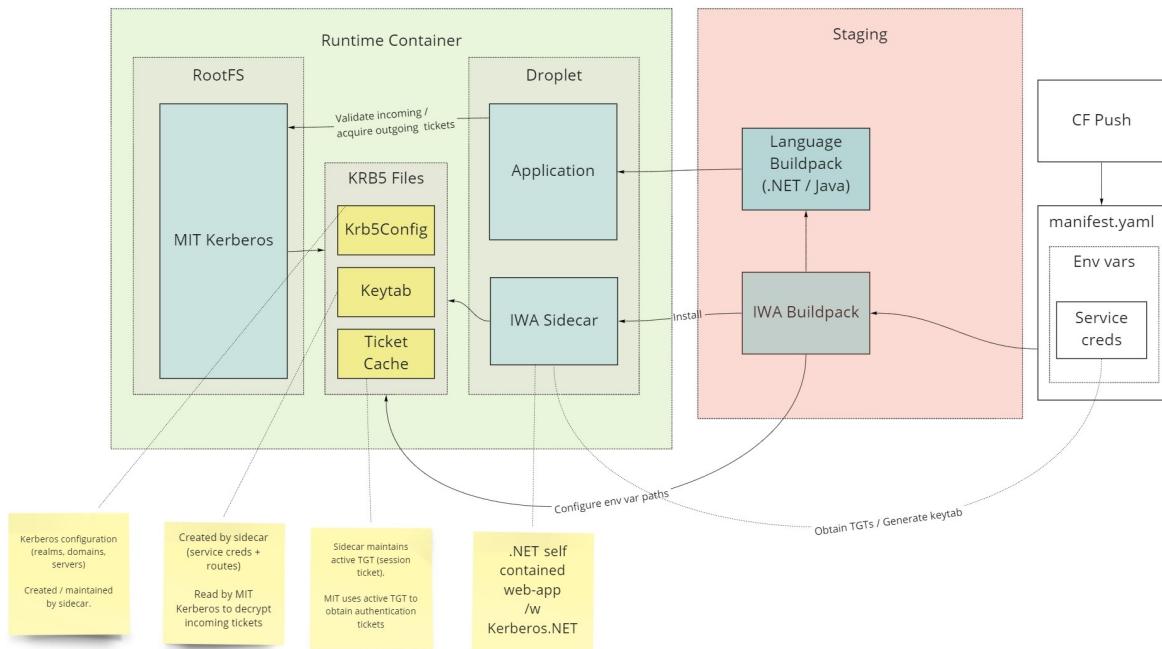
Dependency	Version	CVEs	Release Notes
MariaDB JDBC Driver	2.7.9		<a href="#">Release Notes</a>
Memory Calculator	3.13.0_RELEASE	Included inline above	Included inline above
Metric Writer	3.5.0_RELEASE	Included inline above	Included inline above
New Relic Agent	8.13.0		<a href="#">Release Notes</a>
Open Telemetry Agent	2.6.0		<a href="#">Release Notes</a>
OpenJDK JRE 11	11.0.24_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 17	17.0.12_10	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 21	21.0.4_9	Risk Matrix	<a href="#">Release Notes</a>
OpenJDK JRE 8	1.8.0_422	Risk Matrix	<a href="#">Release Notes</a>
PostgreSQL JDBC Driver	42.7.3		<a href="#">ChangeLog</a>
Redis Session Store	1.3.6_RELEASE	Included inline above	Included inline above
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SeaLights Agent	4.0.2539		
SkyWalking	9.3.0		<a href="#">ChangeLog</a>
Splunk OpenTelemetry Java Agent	2.6.0		<a href="#">Release Notes</a>
Spring Auto-reconfiguration	2.12.0_RELEASE	Included inline above	Included inline above
Spring Boot CLI	2.7.18		
Spring Boot Container Customizer	2.6.0_RELEASE	Included inline above	Included inline above
Takipi Agent	4.73.3		<a href="#">Release Notes</a>
Tomcat	9.0.93	Security	<a href="#">ChangeLog</a>
Tomcat Access Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Lifecycle Support	3.4.0_RELEASE	Included inline above	Included inline above
Tomcat Logging Support	3.4.0_RELEASE	Included inline above	Included inline above
YourKit Profiler	2024.3.157		<a href="#">Release Notes</a>

## Kerberos Buildpack for VMware Tanzu Application Service for VMs (TAS for VMs)

Learn how to configure Kerberos on Linux, so that Kerberos and Integrated Windows Authentication (IWA) work natively in .NET and Java applications.

Download the Kerberos Buildpack at [Kerberos Buildpack for VMware Tanzu Platform for Cloud Foundry](#) on Broadcom Support.

## How it works



This buildpack includes a sidecar process that manages the configuration of MIT Kerberos, which is used by the core libraries in apps to participate in Kerberos authentication (also known as Integrated Windows Authentication).

## Configuring application credentials

Before using the Kerberos Buildpack for VMware Tanzu Application Service for VMs (TAS for VMs), you must determine how credentials will be configured for each application. There are several ways for this information to be provided to the buildpack:

- Using environment variables
- Using CredHub integration
- Using user-provided services

### Using environment variables

The simplest approach is to set the following environment variables for your app:

- `KRB_SERVICE_ACCOUNT`: service account name (in `username@domain.com` format)
- `KRB_PASSWORD`: service account password
- `KRB_KDC`: (optional) Kerberos Key Distribution Center (KDC) address. If not specified, the domain part of `KRB_SERVICE_ACCOUNT` will be used

### Using CredHub integration

CredHub integration allows the safe administration and storage of credentials associated with an app inside of CredHub. With this integration, credentials will be injected as environment variables during container startup. Because this integration is activated during startup, the credentials will be only visible to the app process.



## Prerequisite

The [CredHub service broker](#) needs to be installed on VMware Tanzu Application Service for VMs (TAS for VMs) before you can create and use a CredHub service instance.

1. Create a file named `credentials.json`, with contents similar to this:

```
{
  "ServiceAccount": "my-service@mydomain.com",
  "Password": "<secure-password>"
}
```

2. Create a CredHub service instance that carries the above credentials as following:

```
cf create-service credhub default CREDS_SERVICE_INSTANCE_NAME -c .\credentials.json -t kerberos-service-principal
```

3. Bind the credentials to the app

- Using the `cf` cli (if the app has already been pushed):

```
cf bind-service APP_NAME CREDS_SERVICE_INSTANCE_NAME
```

- Using a [service reference](#) in an application manifest:

```
---
...
services:
- name: CREDS_SERVICE_INSTANCE_NAME
```

## Managing credentials via user-provided services

In order to use user-provided services, follow the [CredHub integration](#) steps, only changing the service instance creation:

```
cf create-user-provided-service CREDS_SERVICE_INSTANCE_NAME -p .\credentials.json -t kerberos-service-principal
```

## Embedding Kerberos configuration into buildpack

By default, the buildpack will attempt to generate an MIT Kerberos configuration file (`krb5.conf`) using the combination of `KRB_KDC` and the realm portion of the service account (everything after `@`). This may not be sufficient in more complex environments, where greater control of the `krb5.conf` is required. Including location of the KDC in the manifest for every single application may also not be desirable.

In order to support these scenarios, `krb5.conf` should be embedded within the buildpack before deployment to the platform. This approach provides uniform application of configuration to all apps and places control over this file in the hands of central platform operator. In order for the buildpack to use your embedded `krb5.conf`, place the file within the buildpack zip file under `/deps/.krb5/krb5.conf`. One way to accomplish this task is by following these steps:

1. Creating a local directory structure that looks like this:

```
.
├── kerberos_buildpack-linux-x64-0.1.0.zip
├── deps
│   └── .krb5
│       └── krb5.conf
```

2. Run the following command to patch the zip file with config file:

PowerShell

```
Compress-Archive -Update -Path deps -DestinationPath kerberos_buildpack-linux-x
64-0.1.0.zip
```

Linux shell

```
zip -ur kerberos_buildpack-linux-x64-0.1.0.zip deps
```

## Configuring for multiple environments

If `krb5.conf` needs to change between environments, multiple `krb5.conf` files can be embedded into the buildpack by creating a folder structure similar to the following and applying the same steps as above:

```
.
├── kerberos_buildpack-linux-x64-0.1.0.zip
├── deps
│   └── .krb5
│       ├── prod
│       │   └── krb5.conf
│       └── qa
│           └── krb5.conf
```

You can control which `krb5.conf` is used by setting the environment variable `KRB_ENVIRONMENT` to match the folder name.

## Using the buildpack

The Kerberos buildpack is an extension buildpack and is not capable of running applications by itself. Another buildpack, such as the .NET Core or Java buildpack must also be used.

- Use multiple buildpacks from the command line:

```
cf push APP-NAME -b KERBEROS-BUILDPACK-NAME-OR-URL -b dotnet_core_buildpack
```

- Use multiple buildpacks in an app manifest:

```
---
applications:
- name: KerberosDemo
  buildpacks:
    - KERBEROS-BUILDPACK-NAME-OR-URL
    - dotnet_core_buildpack
```

## Troubleshooting

Because the buildpack provides functionality via sidecar, the first place to check when issues arise will be the application logs. Please note that sidecar logs may be intermixed with app logs. If the logs do not include a message similar to `Service authenticated successfully as 'iwaclient' or Now listening on: http://0.0.0.0:9090`, it may mean that the worker sidecar has been unable to obtain ticket from your KDC.

If there is nothing useful in the logs, check these items:

- Credentials are correct and specified in the right format
- The KDC is accessible from the container. Use the [sample app](#) to test.
- Increase the verbosity of Kerberos-related logs by setting the following environment variable for the app:
  - `Logging__LogLevel__Kerberos: Debug`

## Sample Application

If you are having trouble, or just getting started with the Kerberos Buildpack for VMware Tanzu Application Service for VMs (TAS for VMs), the sample app that ships alongside the buildpack can be used to test connectivity and validate or understand a variety of settings. Here is a partial list of functionality the sample includes:

- Test that a connection can be established to a KDC server on port 88.
- Test a connection to SQL Server, optionally specifying the connection string via query string for quick iteration.
- Check the health of the sidecar process.

See the README included with the sample for additional functionality and greater detail.

## Using buildpacks

In this section:

- [Working with buildpacks](#)
- [Stack association](#)
- [Pushing your app with multiple buildpacks](#)
- [Using a proxy server](#)
- [Supported binary dependencies](#)
- [Configuring the production server](#)
- [Sidecar buildpacks](#)

## Working with buildpacks in Cloud Foundry

This topic tells you about how buildpacks are structured and detected in Cloud Foundry.

# Buildpack scripts

A buildpack repository might contain the following scripts in the `bin` directory:

- `bin/detect` determines whether or not to apply the buildpack to an app.
- `bin/supply` provides dependencies for an app.
- `bin/finalize` prepares the app for launch.
- `bin/release` provides feedback metadata to Cloud Foundry that indicates how you can run the app.
- `bin/compile` is a deprecated alternative to `bin/supply` and `bin/finalize`.

The `bin/supply` and `bin/finalize` scripts replace the deprecated `bin/compile` script. Older buildpacks might still use `bin/compile` with the latest version of Cloud Foundry. In this case, applying multiple buildpacks to a single app is not supported. Newer buildpacks might still provide `bin/compile` for compatibility with Heroku and older versions of Cloud Foundry.

The `bin/supply` script is required for non final buildpacks. The `bin/finalize` (or `bin/compile`) script is required for final buildpacks.

In this topic, the terms *non final buildpack* and *final buildpack*, or *last buildpack*, are used to describe the process of applying multiple buildpacks to an app.

For example:

```
cf push APP-NAME -b FIRST-BUILDPACK -b SECOND-BUILDPACK -b FINAL-BUILDPACK
```

If you use only one buildpack for your app, this buildpack behaves as a final, or last, buildpack. When using multi buildpack support, the last buildpack in the order is the final buildpack, and is able to make changes to the app and determine a start command. All other specified buildpacks are non final and supply only the dependencies.

## bin/detect

The `detect` script determines whether or not to apply the buildpack to an app. The script is called with one argument, the `build` directory for the app. The `build` directory contains the app files uploaded when you run `cf push`.

The `detect` script returns an exit code of `0` if the buildpack is compatible with the app. In the case of system buildpacks, the script prints the buildpack name, version, and other information to `STDOUT`.

The following is an example `detect` script that checks for a Ruby app that is based on the existence of a `Gemfile`:

```
#!/usr/bin/env ruby

gemfile_path = File.join ARGV[0], "Gemfile"

if File.exist?(gemfile_path)
  puts "Ruby"
  exit 0
else
```

```
exit 1
end
```

The buildpack `detect` script output provides additional details by the buildpack developer. This includes buildpack version information and a list of configured frameworks and their associated versions.

The following is an example of the detailed information returned by the Java buildpack:

```
java-buildpack=v3.0-https://github.com/cloudfoundry/java-buildpack.git#3bd15e1 open-jd
k-jre=1.8.0_45 spring-auto-reconfiguration=1.7.0_RELEASE tomcat-access-logging-support
=2.4.0_RELEASE tomcat-instance=8.0.21 tomcat-lifecycle-support=2.4.0_RELEASE ...
```

By default, Cloud Foundry detects only one buildpack. When you want to detect multiple buildpacks, you must explicitly specify them.

For more information, see [Buildpack detection](#).

## bin/supply

The `supply` script provides dependencies for the app and runs for all buildpacks. All output is sent to `STDOUT` and is relayed to the user through the Cloud Foundry Command Line Interface (cf CLI).

The script is run with four arguments:

- The `build` directory for the app.
- The `cache` directory, which is a location the buildpack can use to store assets during the build process.
- The `deps` directory, which is where dependencies provided by all buildpacks are installed.
- The `index`, which is a number that represents the ordinal position of the buildpack.

The `supply` script stores dependencies in the `deps/index` directory. It might also look in other directories in `deps` to find dependencies supplied by other buildpacks.

The `supply` script must not modify anything outside of the `deps/index` directory. Staging might fail if such modification is detected.

The `cache` directory is provided to the `supply` script for the final buildpack and is preserved even when the buildpack is upgraded or changes. The `finalize` script also has access to this cache directory.

The `cache` directories provided to the `supply` scripts of non final buildpacks are cleared if those buildpacks are upgraded or changed.

The following is an example of a simple `supply` script:

```
#!/usr/bin/env ruby

#sync output

$stdout.sync = true

build_path = ARGV[0]
cache_path = ARGV[1]
deps_path = ARGV[2]
index = ARGV[3]
```

```

install_ruby

private

def install_ruby
  puts "Installing Ruby"

  # !!! build tasks go here !!!
  # download ruby
  # install ruby
end

```

## bin/finalize

The `finalize` script prepares the app for launch and runs only for the last buildpack. All output is sent to `STDOUT` and is relayed to the user through the cf CLI.

The script is run with four arguments:

- The `build` directory for the app.
- The `cache` directory, which is a location the buildpack can use to store assets during the build process.
- The `deps` directory, which is where dependencies provided by all buildpacks are installed.
- The `index`, which is a number that represents the ordinal position of the buildpack.

The `finalize` script might find dependencies installed by the `supply` script of the same buildpack in `deps/index` directory. It might also look in other directories in `deps` to find dependencies that are supplied by other buildpacks.

The `cache` directory provided to the `finalize` script is preserved even when the buildpack is upgraded or otherwise changes. The `supply` script of the same buildpack also has access to this cache directory.

The following example shows a simple `finalize` script:

```

#!/usr/bin/env ruby

#sync output

$stdout.sync = true

build_path = ARGV[0]
cache_path = ARGV[1]
deps_path = ARGV[2]
index = ARGV[3]

setup_ruby

private

def setup_ruby
  puts "Configuring your app to use Ruby"

  # !!! build tasks go here !!!

```

```
# setup ruby
end
```

## Deprecated bin/compile

The `compile` script is deprecated. It encompasses the behavior of the `supply` and `finalize` scripts for single buildpack apps by using the `build` directory to store dependencies.

The script is run with two arguments:

- The `build` directory for the app.
- The `cache` directory, which is a location the buildpack can use to store assets during the build process.

During the running of the `compile` script, all output is sent to `STDOUT` and relayed to the user through the `cf` CLI.

## bin/release

The `release` script provides feedback metadata to Cloud Foundry that indicates how you run the app. The script is run with one argument, the `build` directory. The script must generate a YAML file in the following format:

```
default_process_types:
  web: start_command.filetype
```

The `default_process_types` line indicates the type of app being run and the command used to start it. This start command is used if a start command is not specified in the `cf push` or in a Procfile.

At this time, only the `web` type of apps is supported.

To define environment variables for your buildpack, add a Bash script to the `.profile.d` directory in the root folder of your app.

The following example shows what a `release` script for a Rack app might return:

```
default_process_types:
  web: bundle exec rackup config.ru -p $PORT
```

The `web` command runs as `bash -c COMMAND` when Cloud Foundry starts your app.

## Droplet filesystem

The buildpack staging process extracts the droplet into the `/home/vcap` directory inside the instance container and creates the following filesystem tree:

```
app/
deps/
logs/
tmp/
staging_info.yml
```

The `app` directory includes the contents of the `build` directory, and the `staging_info.yml` file contains the staging metadata saved in the droplet.

## Buildpack detection

When you push an app, Cloud Foundry uses a detection process to determine a single buildpack to use. For general information about this process, see [How Diego Stages Buildpack Apps](#) section of the *How Apps Are Staged* topic.

During staging, each buildpack has a position in a priority list. You can retrieve this position by running the `cf buildpacks`.

Cloud Foundry checks if the buildpack in position 1 is a compatible buildpack. If the position 1 buildpack is not compatible, Cloud Foundry moves on to the buildpack in position 2. Cloud Foundry continues this process until the correct buildpack is found.

If no buildpack is compatible, the `cf push` command fails with the following error:

```
None of the buildpacks detected a compatible application
Exit status 222
Staging failed: Exited with status 222

FAILED
NoAppDetectedError
```

For a more detailed account of how Cloud Foundry interacts with the buildpack, see [Sequence of interactions](#).

## Sequence of interactions

This section describes the sequence of interactions between the Cloud Foundry platform and the buildpack. The sequence of interactions differs depending on whether the platform skips or performs buildpack detection.

### No buildpack detection

Cloud Foundry skips buildpack detection if the developer specifies one or more buildpacks in the app manifest or in the `cf push APP-NAME -b BUILDPACK-NAME` cf CLI command.

If you explicitly specify buildpacks, Cloud Foundry performs the following interactions:

1. For each buildpack except the last buildpack, the platform:
  2. Creates the `deps/index` directory.
  3. Runs `/bin/supply` with the `build`, `cache`, and `deps` directories and the buildpack `index`.
  4. Accepts any modification of the `deps/index` directory.
  5. Accepts any modification of the `cache` directory.
  6. Might disallow modification of any other directories.
7. For the last buildpack, the platform:

8. If `/bin/finalize` is present:
9. Creates the `deps/index` directory if it does not exist.
10. If `/bin/supply` is present, runs `/bin/supply` with the `build`, `cache`, and `deps` directories and the buildpack `index`.
11. Accepts any modification of the `deps/index` directory.
12. Might disallow modification of the `build` directory.
13. Runs `/bin/finalize` with the `build`, `cache`, and `deps` directories and the buildpack `index`.
14. Accepts any modification of the `build` directory.
15. If `/bin/finalize` is not present:
16. Runs `/bin/compile` with the `build` and `cache` directories.
17. Accepts any modification of the `build` directory.
18. Runs `/bin/release` to determine staging information.

At the end of this process, the `deps` directory is included at the root of the droplet, adjacent to the `app` directory.

## Buildpack detection

Cloud Foundry does buildpack detection if you do not specify one or more buildpacks in the app manifest or in the `cf push APP-NAME -b BUILDPACK-NAME` cf CLI command.

Cloud Foundry detects only one buildpack to use with the app.

If the platform performs detection, it:

1. Runs `/bin/detect` for each buildpack.
2. Selects the first buildpack with a `/bin/detect` script that returns a zero exit status.
3. If `/bin/finalize` is present:
4. Creates the `deps/index` directory if it does not exist.
5. If `/bin/supply` is present, runs `/bin/supply` with the `build`, `cache`, and `deps` directories and the buildpack `index`.
6. Accepts any modification of the `deps/index` directory.
7. Might disallow modification of the `build` directory.
8. Runs `/bin/finalize` on the `build`, `cache`, and `deps` directories.
9. Accepts any modification of the `build` directory.
10. If `/bin/finalize` is not present:
11. Runs `/bin/compile` on the `build` and `cache` directories.
12. Accepts any modification of the `build` directory.
13. Runs `/bin/release` to determine staging information.

At the end of this process, the `deps` directory is included at the root of the droplet, adjacent to the `app` directory.

## Stack association in Cloud Foundry buildpacks

Learn about the stack association feature for your Cloud Foundry buildpacks.

To avoid security exposure, verify that you migrate your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

## Stack association

Each buildpack in your deployment is associated with a stack. When you run `cf buildpacks`, you can see this in the `stack` column for each buildpack.

For example:

```
$ cf buildpacks
Getting buildpacks...

position  name                                stack  enabled  locked
filename
1          staticfile_buildpack                cflinuxfs3  true    false
staticfile_buildpack-cached-cflinuxfs3-v1.5.36.zip
2          java_buildpack                   cflinuxfs3  true    false
java_buildpack-cached-cflinuxfs3-v4.53.zip
3          ruby_buildpack                  cflinuxfs3  true    false
ruby_buildpack-cached-cflinuxfs3-v1.9.0.zip
...
12         ruby_buildpack                  cflinuxfs4  true    false
ruby_buildpack-cached-cflinuxfs4-v1.9.0.zip
13         dotnet_core_buildpack            cflinuxfs4  true    false
dotnet-core_buildpack-cached-cflinuxfs4-v2.4.5.zip
...
```

Because of the stack association, buildpacks do not have to be uniquely named. This helps in managing similar buildpacks that are compatible with different stacks.

The [buildpack packager](#) includes a `-stack` option. If you use this option and upload a buildpack, the Cloud Controller detects the stack association, and creates a stack record for the buildpack.

## Missing stack record in buildpacks

Some buildpacks might have a missing stack record, if for example, you uploaded a custom buildpack before Cloud Foundry introduced stack association. The output of `cf buildpacks` shows a blank `stack` column if the buildpack does not have a stack record.

In this case, you must manually assign a stack to the buildpack. To do this, run:

```
cf update-buildpack BUILDPACK-NAME --assign-stack stack
```

Buildpacks with a missing stack record continue to work, but are more manageable when the stack record is present.

If you push apps to a deployment that has buildpacks with a missing stack record, the following might occur:

- If you push an app and specify a stack with `cf push app-name -s stack`, Cloud Foundry uses that stack. Otherwise, it uses the system default, `cflinuxfs4`.
- You might see additional logging in the buildpack detection output of the `cf push` command when Cloud Foundry detects buildpacks without a stack record.

## Managing stack association with the cf CLI

The cf CLI commands for managing buildpacks include functionality to support association between buildpacks and stacks. The `update-buildpack`, `rename-buildpack`, and `delete-buildpack` commands all include a `-s` flag for specifying a stack.

The cf CLI v7 command removes the `cf rename-buildpack` command in favor of a `-rename` option for `cf update-buildpack`.

When using buildpacks with the cf CLI, consider the following:

- You cannot upload a buildpack with `cf create-buildpack` if a buildpack of the same name already exists and has a missing stack record.
- When using `cf create-buildpack`, you might inadvertently create a duplicate buildpack with a `nil` stack. `cf create-buildpack` does not prevent creation of buildpacks with no stack association.
- The `-s` flag is required when there are buildpacks with the same name. If you are working on a uniquely named buildpack, you do not need to specify its stack.
- If you have buildpacks of the same name, one with a stack record and one without, run cf CLI commands without the `-s` flag on the buildpack with the missing stack record.

## Scenario examples

See the following examples for managing buildpacks with the cf CLI. These examples are applicable when running `cf update-buildpack` or `cf delete-buildpack`:

- **Updating or deleting a uniquely-named buildpack:**
  - You have a single buildpack named `my-buildpack`, and it is associated with `stack_a`. To delete the buildpack, run `cf delete-buildpack my-buildpack`. You can also provide `-s stack_a`, but the option is not required if you have a uniquely-named buildpack.
- **Updating or deleting a uniquely-named buildpack that has a `nil` stack:**
  - You have a single buildpack named `my-buildpack`, and it is not associated with a stack. To delete the buildpack, run `cf delete-buildpack my-buildpack`.
- **Updating or deleting a buildpack when another buildpack exists with the same name. Both buildpacks have stack associations:**
  - You have two buildpacks named `my-buildpack`, one that is associated with `stack_a` and the other associated with `stack_b`. To delete the buildpack that uses `stack_a`, run `cf`

```
delete-buildpack my-buildpack -s stack_a.
```

- **Updating or deleting a buildpack when another buildpack exists with the same name.** One buildpack has a stack association, and the other buildpack has a `nil` stack:
  - You have two buildpacks named `my-buildpack`, one associated with `stack_a` and the other with no (`nil`) stack association:
    - To delete the buildpack that uses `stack_a`, run `cf delete-buildpack my-buildpack -s stack_a`.
    - To delete the buildpack that is associated with the `nil` stack, run `cf delete-buildpack my-buildpack`.

## Pushing an app with multiple buildpacks

You can push an app with multiple buildpacks using the Cloud Foundry Command Line Interface (cf CLI).

As an alternative to the cf CLI procedure, you can specify multiple buildpacks in your app manifest. This is not compatible with deprecated app manifest features. For more information, see [Deploying with App Manifests](#).

For more information about pushing apps, see [Pushing an App](#).

## Specifying buildpacks with the cf CLI

To push an app with multiple buildpacks using the cf CLI:



You must use cf CLI v6.38 or later.

1. Ensure that you are using the cf CLI v6.38 or later by running:

```
cf version
```

For more information about upgrading the cf CLI, see [Installing the cf CLI](#).

2. To push your app with multiple buildpacks, specify each buildpack with a `-b` flag by running:

```
cf push YOUR-APP -b BUILDPACK-NAME-1 -b BUILDPACK-NAME-2 ... -b BUILDPACK-NAME-3
```

Where:

- `YOUR-APP` is the name of your app.
- `BUILDPACK-NAME-1`, `BUILDPACK-NAME-2`, and `BUILDPACK-NAME-3` are the names of the buildpacks you want to push with your app.

The last buildpack you specify is the **final buildpack**, which modifies the launch environment and sets the start command.

To see a list of available buildpacks, run:

```
cf buildpacks
```

For more information on multi buildpack order, see [How buildpacks work](#).

For more information about using the cf CLI, see [Using the cf CLI Cloud Foundry command line interface](#).

## Using a proxy server with Cloud Foundry buildpacks

You can use a proxy server with buildpacks for your application.

### Using a proxy server

You can assign proxy servers to environment variables. Proxy servers can be used to monitor your application's traffic or to fetch your application's dependencies.

A buildpack uses a proxy server if that buildpack contacts the internet during staging.

The binary buildpack does not use a proxy server because it does not access the internet during staging.

### Setting environment variables

If you are using a Java buildpack, the `http_proxy` and `https_proxy` environment variables are not supported at runtime. The Java buildpack does not add the functionality to make proxies work at runtime.

To set your environment variables:

1. Add the following to the `env` block of your application manifest YAML file:

```
---
env:
  http_proxy: http://YOUR-HTTP-PROXY:PORT
  https_proxy: https://YOUR-HTTPS-PROXY:PORT
```

Where:

- `YOUR-HTTP-PROXY` is the address of your proxy server for HTTP requests.
- `YOUR-HTTPS-PROXY` is the address of your proxy server for HTTPS requests.
- `PORT` is the port number you are using for your proxy server.

2. Set the environment variables with the Cloud Foundry Command Line Interface (cf CLI) `cf set-env` command:

```
cf set-env YOUR-APP http_proxy "http://YOUR-HTTP-PROXY:PORT"
```

```
cf set-env YOUR-APP https_proxy "https://YOUR-HTTPS-PROXY:PORT"
```

Where:

- `YOUR-APP` is the name of your application.
- `YOUR-HTTP-PROXY` is the address of your proxy server for HTTP requests.
- `YOUR-HTTPS-PROXY` is the address of your proxy server for HTTPS requests.
- `PORT` is the port number you are using for your proxy server.

## Un-setting environment variables

Removing an environment variable from the application manifest YAML file is not sufficient to unset the environment variable.

You must also unset the environment variables with the Cloud Foundry Command Line Interface (cf CLI) `cf unset-env` command:

```
cf unset-env YOUR-APP ENV_VAR_NAME
```

For example:

```
cf unset-env YOUR-APP https_proxy
```

Where:

- `YOUR-APP` is the name of your application.
- `ENV_VAR_NAME` is the name of the environment variable.

## Supported binary dependencies in Cloud Foundry buildpacks

Each buildpack supports only the stable patches for each dependency listed in the buildpack's `manifest.yml` file and also in the GitHub releases page. For example, see the [php-buildpack releases page](#).

If you try to use an unsupported binary, staging your app fails with the following error message:

```
Could not get translated url, exited with: DEPENDENCY_MISSING_IN_MANIFEST:  
...  
!  
!     exit  
!  
Staging failed: Buildpack compilation step failed
```

## Configuring the production server for Cloud Foundry apps

You can configure a production server for your apps in Cloud Foundry.

When you deploy an app, Cloud Foundry determines the command that is used to start the app through the following process:

1. If you use the command `cf push -c COMMAND`, then Cloud Foundry uses `COMMAND` to start the app.
2. If you create a file called a Procfile, Cloud Foundry uses Procfile to configure the command that launches the app. See [About Procfiles](#).
3. If you do not use `cf push -c COMMAND` and do not create a Procfile, then Cloud Foundry does one of the following, depending on the buildpack:
  - Uses a default start command.
  - Fails to start the app and shows a warning that the app is missing a Procfile.

## Procfiles

Use a Procfile to specify a start command for buildpacks when a default start command is not provided. Some buildpacks use Python to work on a variety of frameworks and do not attempt to provide a default start command.

Another reason to use a Procfile is to configure a production server for web apps.

When you use a Procfile, you declare required runtime processes, and called process types, for your web app. Process managers in a server use the process type to run and manage the workload.

In a Procfile, you declare one process type per line and use the following syntax:

```
PROCESS-TYPE: COMMAND
```

Where:

- `PROCESS-TYPE` is `web`. A `web` process handles HTTP traffic.
- `COMMAND` is the command line to launch the process.

For example, a Procfile with the following content starts the launch script created by the build process for a Java app:

```
web: build/install/MY-PROJECT-NAME/bin/MY-PROJECT-NAME
```

Procfile support is integrated into the [buildpack lifecycle](#). However, due to differing behavior of buildpacks, it might not be suitable with all buildpacks.

Procfiles can be used with the following buildpacks:

- [Binary buildpack](#)
- [.NET Core buildpack](#)
- [Go buildpack](#)
- [NGINX buildpack](#)
- [Node.js buildpack](#)
- [Python buildpack](#)
- [R buildpack](#)
- [Ruby buildpack](#)

## Specifying a web server

Follow these steps to specify a web server using a Procfile. For more information about configuring a web server for Rails apps, see [Configuring a Ruby web server](#).

1. Create a blank file with a command line for a `web` process type.
2. Save it as a file named `Procfile` with no extension in the root directory of your app.
3. Push your app.

## Configuring a Ruby web server

Cloud Foundry uses the default standard Ruby web server library WEBrick for Ruby and Ruby on Rails apps. However, Cloud Foundry can support a more robust production web server. For example, Phusion Passenger, Puma, Thin, or Unicorn.

To instruct Cloud Foundry to use a web server other than WEBrick, use the following steps:

1. Add the gem for the web server to your Gemfile.
2. In the `config` directory of your app, create a new configuration file or modify an existing file. See your web server documentation for how to configure this file.

The following example uses the Puma web server:

```
# config/puma.rb
threads 8,32
workers 3

on_worker_boot do
# things workers do
end
```

3. In the root directory of your app, create a Procfile and add a command line for a `web` process type that points to your web server. For information about configuring the specific command for a process type, see your web server documentation.

The following example shows a command that starts a Puma web server and specifies the app runtime environment, TCP port, paths to the server state information, and configuration files:

```
web: bundle exec puma -e $RAILS_ENV -p 1234 -S ~/puma -C config/puma.rb
```

## Sidecar buildpacks

Learn how buildpacks deploy sidecar processes alongside your app.

Sidecar processes are additional dependent processes that are run in the same container as the main app process. For more information, see [How to Push an App to Cloud Foundry with Sidecars](#).

## Specifying sidecar processes

A buildpack can specify sidecar processes with a `launch.yml` file at the root of the `deps` directory during the `supply` phase. The `deps` directory is a combination of the `DEPS_DIR` and `DEP_IDX` values. For more information about how these two values are passed to the buildpack interface, see [How buildpacks work](#).

The following defines the relevant fields of the `launch.yml` file in more detail:

- `type`: A key that is mapped to a individual command.

It is possible for multiple buildpacks to write their own `launch.yml` files. If two of these files have the same `type` keys, the `launch.yml` file written last overwrites the previous commands of the

same type.

- `command`: The command to be run in the container. Container health is dependent on this command. The container fails when the command is no longer running.
- `limits`: Resource limits that are placed on the sidecar process.
- `memory`: The memory limit is in MB. If you use the sidecar buildpack with a Java app, you must configure this field to allocate memory to the sidecar. If you do not configure the field, the Java buildpack allocates all of the available memory to the app.
- `platforms`: A key specifying the data that must be read by a platform. For example, Cloud Foundry only reads data under the `cloudfoundry` key.
- `sidecar_for`: A list of `types` that the `command` uses for a sidecar process. Each `type` requires a health check. The `command` cannot run until each health check is passed. The more `types` that are listed, the more health checks are required. If any health check fails, the `command` does not run.

Example `launch.yml` file:

```
---
processes:
- type: "PROCESS-NAME"
  command: "COMMAND"
  limits:
    memory: 10
  platforms:
    cloudfoundry:
      sidecar_for: [ "TYPE-1", "TYPE-2", "TYPE-3" ]
```

Where:

- `PROCESS-NAME` is the command that is mapped to the `type` field.
- `COMMAND` is the command that is mapped to the `command` field. For example, `./binary` or `java -jar java-file.jar`.
- `TYPE-1`, `TYPE-2` and `TYPE-3` are the `types` that the `command` uses for the sidecar process.

## Buildpack example

The following buildpack example functions as a supply buildpack, or the non final buildpack in a multi buildpack build. The only purpose for this function is to write the `launch.yml` file to the buildpack's `deps` directory.

For the full sidecar buildpack, see [example-sidecar-buildpack](#) repository on GitHub.

The `example-sidecar-buildpack` has the following directory structure:

```
bin/
bin/supply
manifest.yml
VERSION
```

The `supply` script writes a `launch.yml` file to a specific location, `bin/supply`, as in the following example:

```

#!/bin/bash

set -euo pipefail

BUILD_DIR=$1
CACHE_DIR=$2
DEPS_DIR=$3
DEPS_IDX=$4

LAUNCH_CONTENTS='---
processes:
- type: "sidecar_process"
  command: "while true; do echo hello from a sidecar process; sleep 10; done"
  platforms:
    cloudfoundry:
      sidecar_for: [ "web"]
'

echo "-----> Running sidecar supply"

export BUILDPACK_DIR=`dirname $(readlink -f ${BASH_SOURCE%/*})` `

pushd "$BUILDPACK_DIR"
echo "$LAUNCH_CONTENTS" > "$DEPS_DIR"/"$DEPS_IDX"/launch.yml
popd

```

## Customizing and developing buildpacks

In this section:

- [Customizing and developing buildpacks](#)
- [Creating custom buildpacks](#)
- [Packaging dependencies for offline buildpacks](#)
- [Merging with upstream buildpacks](#)
- [Upgrading dependency versions](#)
- [Releasing a new buildpack version](#)
- [Updating buildpack-related gems](#)

## Customizing and developing buildpacks in Cloud Foundry

Buildpacks enable you to package frameworks and runtime support for your application. Cloud Foundry provides system buildpacks and an interface for customizing existing buildpacks and developing new buildpacks.

## Customizing and creating buildpacks

If your application uses a language or framework that the Cloud Foundry system buildpacks do not support, do one of the following:

- Use a Cloud Foundry Community Buildpack.
- Use a Heroku Third-Party Buildpack.
- Customize an existing buildpack or create your own [custom buildpack](#).

A common development practice for custom buildpacks is to fork existing buildpacks and sync subsequent patches from upstream.

For information about customizing an existing buildpack or creating your own, see the following:

```
+ <a href="../custom.html" class="subnav">Creating Custom Buildpacks</a>
+ <a href="../depend-pkg-offline.html" class="subnav">Packaging Dependencies for Offline Buildpacks</a>
```

## Maintaining buildpacks

After you have modified an existing buildpack or created your own, it is necessary to maintain it.

See the following topics to maintain your own buildpacks:

- [Merging with upstream buildpacks](#)
- [Upgrading dependency versions](#)

To configure a production server for your web app, see [Configuring a production server](#).

## Using CI for buildpacks

For information about updating and releasing a new version of a Cloud Foundry buildpack through the Cloud Foundry Buildpacks Team Concourse pipeline, see [Using CI for buildpacks](#). You can use this as a model when working with Concourse to build and release new versions of your own buildpacks.

## Creating custom buildpacks for Cloud Foundry

You can create custom buildpacks for Cloud Foundry.

For more information about how buildpacks work, see [How Buildpacks Work](#).



Tanzu by Broadcom does not support the use of forked, modified, or custom-compiled variations of Tanzu or Paketo Cloud Native Buildpacks. The guidance below is supplementary and for informational purposes only.

## Packaging custom buildpacks

Cloud Foundry buildpacks can work with limited or no internet connectivity. The Buildpack Packager gives the same flexibility to custom buildpacks, enabling them to work in partially or completely disconnected environments. For more information, see the [Buildpack Packager](#) repository on GitHub.

## Using the Buildpack Packager

To use the Buildpack Packager:

1. Download the Buildpack Manager from the [Buildpack Packager](#) repository on GitHub.
2. Create a `manifest.yml` file in your buildpack.
3. Run the packager in cached mode:

```
buildpack-packager build -cached -any-stack
```

The packager adds everything in your buildpack directory into a ZIP file, and excludes anything marked for exclusion in your manifest.

In cached mode, the packager downloads, and adds dependencies as described in the manifest.

For more information, see [Buildpack Packager](#) repository on GitHub.

## Using and sharing the packaged buildpack

After you have packaged the buildpack using Buildpack Packager, you can use the ZIP file locally, or share it with others by uploading it to any network location that is accessible to the CLI. You can then specify the buildpack with the `-b` option when you push apps. For more information, see [Deploying Apps with a Custom Buildpack](#).

Offline buildpack packages might contain proprietary dependencies that require distribution licensing or export control measures. For more information about offline buildpacks, see [About Offline Buildpacks](#) section of the *Packaging dependencies for offline Buildpacks* topic.

## Specifying a default version

As of Buildpack Packager v2.3.0, you can specify the default version for a dependency by adding a `default_versions` object to the `manifest.yml` file. The `default_versions` object has two properties, `name` and `version`.

For example:

```
default_versions:
- name: go
  version: 1.6.3
- name: other-dependency
  version: 1.1.1
```

To specify a default version:

1. Add the `default_version` object to your manifest, following the guidance in [Rules for Specifying a Default Version](#). For a complete example, see `manifest.yml` in the Cloud Foundry Go(Lang) Buildpack repository in GitHub.
2. Run the `default_version_for` script from the `compile-extensions` repository, passing the path of your `manifest.yml` and the dependency name as arguments. Run:

```
./compile-extensions/bin/default_version_for manifest.yml DEPENDENCY-NAME
```

Where `DEPENDENCY-NAME` is the `name` property from the `default_versions` object in your `manifest.yml` file.

For more information, see [Buildpack Packager v2.3.0](#) in the Buildpack Packager repository on GitHub.

## Rules for specifying a default version

The Buildpack Packager script validates this object according to the following rules:

- You can create at most one entry under `default_versions` for a single dependency. The following example causes Buildpack Packager to fail with an error because the manifest file specifies two default versions for the same `go` dependency.

```
default_versions:
- name: go
  version: 1.6.3
- name: go
  version: 1.7.5
```

- If you specify a `default_version` for a dependency, you must also list that dependency and version under the `dependencies` section of the manifest. The following example causes Buildpack Packager to fail with an error because the manifest specifies `version: 1.9.2` for the `go` dependency, but lists `version: 1.7.5` under `dependencies`.

```
default_versions:
- name: go
  version: 1.9.2

dependencies:
- name: go
  version: 1.7.5
  uri: https://storage.googleapis.com/golang/go1.7.5.linux-amd64.tar.gz
  md5: c8cb76e2308c792e2705c2eb1b55de95
  cf_stacks:
- cflinuxfs3
```



To avoid security exposure, verify that you migrate your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

## Core buildpack communication contract

Learn about the communication contract followed by the Cloud Foundry core buildpacks. This contract enables buildpacks to interact with one another, so that you can use multiple buildpacks with your apps.

You must ensure your custom buildpacks follow the contract.

This section uses the following placeholders:

- `IDX` is the zero-padded index matching the position of the buildpack in the priority list.
- `MD5` is the MD5 checksum of the buildpack's URL.

For all buildpacks that supply dependencies through `/bin/supply`:

- The buildpack must create `/tmp/deps/IDX/config.yml` to provide a name to subsequent buildpacks. This file might also contain miscellaneous configuration for subsequent buildpacks.

- The `config.yml` file must be formatted as:

```
name: BUILDPACK
config: YAML-OBJECT
```

Where:

- `BUILDPACK` is the name of the buildpack providing dependencies.
- `YAML-OBJECT` is the YAML object that contains buildpack-specific configuration.
- The following directories can be created inside of `/tmp/deps/IDX/` to provide dependencies to subsequent buildpacks:
  - `/bin`: Contains binaries intended for `$PATH` during staging and launch.
  - `/lib`: Contains libraries intended for `$LD_LIBRARY_PATH` during staging and launch.
  - `/include`: Contains header files intended for compilation during staging.
  - `/pkgconfig`: Contains `pkgconfig` files intended for compilation during staging.
  - `/env`: Contains environment variables intended for staging, loaded as `FILENAME=FILECONTENTS`.
  - `/profile.d`: Contains scripts intended for `/app/.profile.d`, sourced before launch.
- The buildpack might make use of previous non-final buildpacks by scanning `/tmp/deps/` for index-named directories containing `config.yml`.

For the last buildpack:

- To make use of dependencies provided by the previously applied buildpacks, the last buildpack must scan `/tmp/deps/` for index-named directories containing `config.yml`.
- To make use of dependencies provided by previous buildpacks, the last buildpack:
  - Can use `/bin` during staging, or make it available in `$PATH` during launch.
  - Can use `/lib` during staging, or make it available in `$LD_LIBRARY_PATH` during launch.
  - Can use `/include`, `/pkgconfig`, or `/env` during staging.
  - Can copy files from `/profile.d` to `/tmp/app/.profile.d` during staging.
  - Can use the supplied config object in `config.yml` during the staging process.

## Deploying apps with a custom buildpack

Once a custom buildpack has been created and pushed to a public Git repository, the Git URL can be passed through the `cf` CLI when pushing an app.

For example, you can use a buildpack that has been pushed to GitHub by running:

```
cf push YOUR-APP -b git://github.com/REPOSITORY/BUILDPACK.git
```

Where:

- `YOUR-APP` is the name of your app.

- **REPOSITORY** is the name of your public Git repository.
- **BUILDPACK** is the name of your custom buildpack.

Alternatively, you can use a private Git repository, with HTTPS, and username and password authentication:

```
cf push YOUR-APP -b https://USERNAME:PASSWORD@github.com/REPOSITORY/BUILDPACK.git
```

Where:

- **YOUR-APP** is the name of your app.
- **USERNAME** is your Git username.
- **PASSWORD** is the name of your Git password.
- **REPOSITORY** is the name of your public Git repository.
- **BUILDPACK** is the name of your custom buildpack.

By default, Cloud Foundry uses the default branch of the buildpack's Git repository. You can specify a different branch using the Git URL:

```
cf push YOUR-APP -b https://github.com/REPOSITORY/BUILDPACK.git#BRANCH
```

Where:

- **YOUR-APP** is the name of your app.
- **REPOSITORY** is the name of your public Git repository.
- **BUILDPACK** is the name of your custom buildpack.
- **BRANCH** is the branch you want to use.

Additionally, you can use tags in a Git repository:

```
cf push YOUR-APP -b https://github.com/REPOSITORY/BUILDPACK#TAG
```

Where:

- **YOUR-APP** is the name of your app.
- **REPOSITORY** is the name of your public Git repository.
- **BUILDPACK** is the name of your custom buildpack.
- **TAG** is the Git repository tag you want to use.

The app is then deployed to Cloud Foundry, and the buildpack is cloned from the repository and applied to the app.

If a buildpack is specified using `cf push -b`, the `detect` step is skipped. As a result, no buildpack `detect` scripts are run.

## Deactivate Custom Buildpacks

Operators can choose to deactivate custom buildpacks. For more information, see the [Deactivating Custom Buildpacks](#) section of the *Managing Custom Buildpacks* topic.

A common development practice for custom buildpacks is to fork existing buildpacks and sync subsequent patches from upstream. To merge upstream patches to your custom buildpack, see [Syncing a fork](#) in the GitHub documentation.

## Packaging dependencies for offline buildpacks

Learn about the dependency storage options that are available to you when creating offline buildpacks.

### About offline buildpacks

Online, or uncached, buildpacks require an internet connection to download dependencies. For example, language interpreters, and compilers. Alternatively, you can create offline, or cached, buildpacks that are packaged with their dependencies. These offline buildpacks do not connect to the Internet when they are used to deploy Cloud Foundry apps.

Offline buildpacks might contain proprietary dependencies that require distribution licensing or export control measures.

You can find instructions for building offline packages in the `README.md` file for each buildpack repository. For example, see the [Java buildpack](#).

### Packaging dependencies in the buildpack

A simple way to package dependencies for a custom buildpack is to keep the dependencies in your buildpack source. However, this is not recommended. Keeping the dependencies in your source consumes unnecessary space.

To avoid keeping the dependencies in source control, load the dependencies into your buildpack, and provide a script for the operator to create a zipfile of the buildpack.

For example, you might complete the following process:

```
$ # Clones your buildpack
$ git clone http://YOUR-GITHUB-REPOSITORY.example.com/repository
$ cd SomeBuildPackName

$ # Creates a zipfile using your script
$ ./SomeScriptName
----> downloading-dependencies.... done
----> creating zipfile: ZippedBuildPackName.zip

$ # Adds the buildpack zipfile to the Cloud Foundry instance
$ cf create-buildpack SomeBuildPackName ZippedBuildPackName.zip 1
```

### Pros

- Least complicated process for operators.
- Least complicated maintenance process for buildpack developers.

## Cons

- Cloud Foundry admin buildpack uploads are limited to 1 GB, so the dependencies might not fit.
- Security and functional patches to dependencies require updating the buildpack.

## Packaging selected dependencies in the buildpack

This is a variant of the [package dependencies in the buildpack](#) method. In this variation, the administrator edits a configuration file. For example, the `dependencies.yml` file to include a limited subset of the buildpack dependencies, packages, and uploads to the buildpack.

This approach is not recommended. See the Cons section for more information.

The administrator completes the following steps:

```
$ # Clones your buildpack
$ git clone http://YOUR-GITHUB-REPOSITORY.example.com/repository
$ cd SomeBuildPackName

$ # Selects dependencies
$ vi dependencies.yml # Or copy in a preferred config

$ # Builds a package using your script
$ ./package
----> downloading-dependencies.... done
----> creating zipfile: cobol_buildpack.zip

$ # Adds the buildpack to the Cloud Foundry instance
$ cf create-buildpack cobol-buildpack cobol_buildpack.zip 1

$ # Pushes an app using your buildpack
$ cd ~/my_app
$ cf push my-cobol-webapp -b cobol-buildpack
```

## Pros

- It's possible to avoid the Cloud Foundry admin buildpack upload size limit in the following ways:
  - The administrator chooses a limited subset of dependencies.
  - The administrator maintains different packages for different dependency sets.

## Cons

- More complex for buildpack maintainers.
- Security updates to dependencies require updating the buildpack.
- Proliferation of buildpacks require maintenance:
  - For each configuration, there is an update required for each security patch.
  - Culling orphan configurations can be difficult or impossible.
  - Administrators need to track configurations and merge them with updates to the buildpack.

- Might result in a different configuration for each app.

## Relying on a local mirror

In this method, the administrator provides a compatible file store of dependencies. When running the buildpack, the administrator specifies the location of the file store.

The administrator completes the following process:

```
$ # Clones your buildpack
$ git clone http://YOUR-GITHUB-REPOSITORY.example.com/repository
$ cd SomeBuildPackName

$ # Builds a package using your script
$ ./package https://dependency/repository
----> creating zipfile: cobol_buildpack.zip

$ # Adds the buildpack to the Cloud Foundry instance
$ cf create-buildpack cobol-buildpack cobol_buildpack.zip 1

$ # Pushes an app using your buildpack
$ cd ~/my_app
$ cf push my-cobol-webapp -b cobol-buildpack
----> deploying app
----> downloading dependencies:
      https://OUR-INTERNAL-SITE.example.com/dependency/repository/dep1.tgz...
done
      https://OUR-INTERNAL-SITE.example.com/dependency/repository/dep2.tgz...
WARNING: dependency not found!
```

### Pros

- Avoids the Cloud Foundry admin buildpack upload size limit.
- Leaves the administrator completely in control of providing dependencies.
- Security and functional patches for dependencies can be maintained separately on the mirror given the following conditions:
  - The buildpack is designed to use newer semantically versioned dependencies.
  - Buildpack behavior does not change with the newer functional changes.

### Cons

- The administrator needs to set up and maintain a mirror.
- The additional config option presents a maintenance burden.

## Merging with upstream buildpacks

Learn how to maintain your forked buildpack by merging it with the upstream Cloud Foundry buildpack. This process keeps your fork updated with changes from the original buildpack, providing patches, updates, and

new features.

The following procedure assumes that you are maintaining a custom buildpack that was forked from a Cloud Foundry system buildpack. However, you can use the same procedure to update a buildpack forked from any upstream buildpack.

To sync your forked buildpack with an upstream Cloud Foundry buildpack:

1. Go to your forked repository on GitHub and click **Compare**. The **Comparing changes** page shows the unmerged commits between your forked buildpack and the upstream buildpack. Inspect unmerged commits and confirm that you want to merge them all.
2. Go to the forked repository and set the upstream remote as the Cloud Foundry buildpack repository.

```
$ cd ~/workspace/ruby-buildpack
$ git remote add upstream git@github.com:cloudfoundry/ruby-buildpack.git
```

3. Pull down the remote upstream changes.

```
$ git fetch upstream
```

4. Merge the upstream changes into the intended branch. You might need to resolve merge conflicts. This example shows the merging of the `main` branch of the upstream buildpack into the `main` branch of the forked buildpack.

```
$ git checkout main
$ git merge upstream/main
```



When you merge upstream buildpacks, do not use `git rebase`. This approach is not sustainable because you confront the same merge conflicts repeatedly.

5. Run the buildpack test suite to ensure that the upstream changes do not break anything.

```
$ BUNDLE_GEMFILE=cf.Gemfile buildpack-build
```

6. Push the updated branch.

```
$ git push
```

Your forked buildpack is now synced with the upstream Cloud Foundry buildpack.

For more information about syncing forks, see [Syncing a fork](#).

## Upgrading dependency versions for Cloud Foundry

This topic tells you how to upgrade a dependency version in a custom buildpack. These procedures enable Cloud Foundry (CF) operators to maintain custom buildpacks that contain dependencies outside of the dependencies in the CF system buildpacks.

## Cloud Foundry buildpacks team process

The procedures in this topic refer to the tools used by the CF buildpacks team, but they do not require the following specific tools. You can use any continuous integration (CI) system and workflow management tool to update dependencies in custom buildpacks.

The CF buildpacks team uses the following tools to update dependencies:

- Concourse deployment of the [buildpacks-ci](#) pipelines.
- [public-buildpacks-ci-robots](#) GitHub repository.
- Pivotal Tracker for workflow management.

When the [New Releases](#) job in the [notifications pipeline](#) detects a new version of a tracked dependency in a buildpack, it creates a [Tracker](#) story about building and including the new version of the dependency in the buildpack manifests. It also posts a message as the [dependency-notifier](#) to the [#buildpacks](#) channel in the Cloud Foundry Slack channel.

## Building binaries

For all dependencies, you must build the binary from source or acquire the binary as a tarball from a trusted source. For most dependencies, the CF buildpacks team builds the binaries from source.

The following steps assume you are using a Concourse deployment of the [buildpacks-ci](#) pipelines and Pivotal Tracker.

To build the binary for a dependency:

1. Go to the [public-buildpacks-ci-robots](#) directory and verify no uncommitted changes exist.

```
$ cd ~/workspace/public-buildpacks-ci-robots
$ git status
```

2. Run the [git pull](#) command in the directory to ensure it contains the most recent version of the contents.

```
$ git pull -r
```

3. Go to the [binary-builds](#) directory.

```
$ cd binary-builds
```

4. Locate the YAML file for the buildpack that you want to build a binary. The directory contains YAML files for all the packages and dependencies tracked by the CF buildpacks team. Each YAML file correlates to the build queue for one dependency or package, and uses the naming format [DEPENDENCY-NAME.yml](#). For example, the YAML file tracking the build queue for Ruby is named [ruby-builds.yml](#) and contains the following contents:

```
---
ruby: []
```

5. Different buildpacks use different signatures for verification. Determine which signature your buildpack requires by consulting the list in the [buildpacks](#) section of this topic and follow the instructions to locate the SHA256, MD5, or GPG signature for the binary:

6. For the SHA256 of a file, run `shasum -a 256 FILE-NAME`.
7. For the MD5 of a file, run `md5 FILE-NAME`.
8. For the GPG signature (for Nginx), see the [Nginx Downloads](#) page.
9. Add the version and verification for the new binary to the YAML file as attributes of an element under the dependency name. For example, to build the Ruby 2.3.0 binary verified with SHA256, add the following to the YAML file:

```
---
ruby:
- version: 2.3.0
  sha256: ba5ba60e5f1aa21b4ef8e9bf35b9ddb57286cb546aac4b5a28c71f459467e507
```



Do not preface the version number with the name of the binary or language. For example, specify `2.3.0` for `version` instead of `ruby-2.3.0`.

You can enqueue builds for multiple versions at the same time. For example, to build both the Ruby 2.3.0 binary and the Ruby 2.3.1 binary, add the following to the YAML file:

```
---
ruby:
- version: 2.3.0
  sha256: ba5ba60e5f1aa21b4ef8e9bf35b9ddb57286cb546aac4b5a28c71f459467e507
- version: 2.3.1
  sha256: b87c738cb2032bf4920fef8e3864dc5cf8eae9d89d8d523ce0236945c5797dcd
```

10. Use the `git add` command to stage your changes:

```
$ git add .
```

11. Use the `git commit -m "YOUR-COMMIT-MESSAGE [#STORY-NUMBER]"` command to commit your changes using the Tracker story number. Replace `YOUR-COMMIT-MESSAGE` with your commit message, and `STORY-NUMBER` with the number of your Tracker story.

```
$ git commit -m "make that change [#1234567890]"
```

12. Run `git push` to push your changes to the remote origin.

```
$ git push
```

13. Pushing your changes initiates the binary building process, which you can monitor at the [binary-builder pipeline](#) of your own `buildpacks-ci` Concourse deployment. When the build completes, it adds a link to the Concourse build run to the Tracker story specified in the commit message for the new release.

Binary builds are run by the Cloud Foundry [Binary Builder](#) and the [dependency-builds](#) pipeline.

## Updating buildpack manifests

After you build the binary for a dependency that you want to access and download from a URL, follow the instructions to add the dependency version to the buildpack manifest.

The following steps assume you are using a Concourse deployment of the `buildpacks-ci` pipelines and Pivotal Tracker.

To add the dependency version to the buildpack manifest, use these steps:

1. Go to the directory of the buildpack for which you want to update dependencies and run `git checkout develop` to check out the `develop` branch.

```
$ cd ~/workspace/ruby-buildpack
$ git checkout develop
```

2. Edit the `manifest.yml` file for the buildpack to add or remove dependencies.

```
dependencies:
  - name: ruby
    version: 2.3.0
    md5: 535342030a11abeb11497824bf642bf2
    uri: https://pivotal-buildpacks.s3.amazonaws.com/concourse-binaries/ruby/ruby-2.3.0-linux-x64.tgz
    cf_stacks:
      - cflinuxfs4
```

- Follow the current structure of the manifest. For example, if the manifest includes the two most recent patch versions for each minor version of the language, you can also include the two most recent patch versions for each minor version of the language, such as both `ruby-2.1.9` and `ruby-2.1.8`.
- Copy the `uri` and the `md5` from the `build-BINARY-NAME` job that ran in the Concourse dependency-builds pipeline and add them to the manifest.

In the PHP buildpack, you might see a `modules` line for each PHP dependency in the manifest. Do not include this `modules` line in your new PHP dependency entry. The `modules` line is added to the manifest by the `ensure-manifest-has-modules` Concourse job in the `php-buildpack` when you commit and push your changes. You can see this in the output logs of the `build-out` task.

3. Replace any other mentions of the old version number in the buildpack repository with the new version number. The CF buildpack team uses `Ag` for text searching.

```
$ ag OLD-VERSION
```

4. Run the following command to package and upload the buildpack, set up the org and space for tests in the specified CF deployment, and run the CF buildpack tests:

```
$ BUNDLE_GEMFILE=cf.Gemfile buildpack-build
```

If the command fails, you might need to fix or change the tests, fixtures, or other parts of the buildpack.

5. Once the test suite completely passes, use git commands to stage, commit, and push your changes:

```
$ git add .
$ git commit -m "YOUR-MESSAGE[#TRACKER-STORY-ID]"
$ git push
```

- Monitor the `LANGUAGE-buildpack` pipeline in Concourse. Once the test suite builds, the `specs-lts-develop` job and `specs-edge-develop` job, pass for the buildpack, you can deliver the Tracker story for the new Dependency release. Copy and paste links for the successful test suite builds into the Tracker story.

## Buildpacks

The following list contains information about the buildpacks maintained by the CF buildpacks team:

### Go:

- Built from:** A tarred binary, `GO-VERSION.linux-amd64.tar.gz`, provided by [Google on the Go Downloads page](#).
- Verified with:** The MD5 of the tarred binary.
- Example:** [Using the Google Tarred Binary for Go 1.6.2](#).

### Godep:

- Built from:** A source code `.tar.gz` file from the [Godep GitHub releases page](#).
- Verified with:** The SHA256 of the source **Example:** [Automated enqueueing of binary build for Godep 72](#).

The `buildpacks-ci dependency-builds` pipeline automates the process of detecting, uploading, and updating Godep in the manifest.

## Node.js buildpack

### Node:

- Verified with:** The SHA256 of the `node-vVERSION.tar.gz` file listed on <https://nodejs.org/dist/vVERSION/SHASUMS256.txt> For example, for Node version 4.4.6, the CF buildpacks team verifies with the SHA256 for `node-v4.4.6.tar.gz` on its [SHASUMS256 page](#).
- Example:** [Enqueuing binary builds for Node 4.4.5 and 6.2.0](#).

## Python buildpack

### Python:

- Verified with:** The MD5 of the `Gzipped source tarball`, listed on <https://www.python.org/downloads/release/python-VERSION/>, where `VERSION` has no periods. For example, for Python version `2.7.12`, use the MD5 for the `Gzipped source tarball` on its [downloads page](#).
- Example:** [Enqueuing binary build for Python 2.7.12](#).

## Java buildpack

**OpenJDK:**

- **Built from:** The tarred [OpenJDK files](#) managed by the CF Java Buildpack team.
- **Verified with:** The MD5 of the tarred OpenJDK files.

**Ruby buildpack****JRuby:**

- **Verified with:** The MD5 of the Source [.tar.gz](#) file from the [JRuby Downloads](#) page.
- **Example:** [Enqueuing binary build for JRuby 9.1.2.0](#).

**Ruby:**

- **Verified with:** The SHA256 of the source from the [Ruby Downloads](#) page.
- **Example:** [Enqueuing binary builds for Ruby 2.2.5 and 2.3.1](#).

**Bundler:**

- **Verified with:** The SHA256 of the [.gem](#) file from [Rubygems](#).
- **Example:** [Enqueuing binary build for Bundler 1.12.5](#).

**PHP buildpack****PHP:**

- **Verified with:** The SHA256 of the [.tar.gz](#) file from the [PHP Downloads](#) page.
- To enqueue builds for PHP, you need to edit a file in the [public-buildpacks-ci-robots](#) repository. For PHP5 versions, the CF buildpacks team enqueues builds in the [binary-builds/php-builds.yml](#) file. For PHP7 versions, the CF buildpacks team enqueues builds in the [binary-builds/php7-builds.yml](#) file.
- **Example:** [Enqueuing binary builds for PHP 7.2.5 and 7.0.30](#).

**Nginx:**

- **Verified with:** The [gpg-rsa-key-id](#) and [gpg-signature](#) of the version. The [gpg-rsa-key-id](#) is the same for each version/build, but the [gpg-signature](#) is different. This information is located on the [Nginx Downloads](#) page.
- **Example:** [Enqueuing binary build for Nginx 1.11.0](#).

**HTTPD:**

- **Verified with:** The MD5 of the [.tar.bz2](#) file from the [HTTPD Downloads](#) page.
- **Example:** [Enqueuing binary build for HTTPD 2.4.20](#).

**Composer:**

- **Verified with:** The SHA256 of the [composer.phar](#) file from the [Composer Downloads](#) page.
- For Composer, there is no build process as the [composer.phar](#) file is the binary. In the manual process, connect to the appropriate S3 bucket using the correct AWS credentials. Create a new directory with the name of the composer version, for example [1.0.2](#), and put the appropriate [composer.phar](#) file into that directory.

For Composer `v1.0.2`, connect and create the `php/binaries/trusty/composer/1.0.2` directory. Then place the `composer.phar` file into that directory so the binary is available at `php/binaries/trusty/composer/1.0.2/composer.phar`.

The `buildpacks-ci dependency-builds` pipeline automates the process of detecting, uploading, and updating Composer in the manifest.

- **Example:** Automated enqueueing of binary build for Composer 1.1.2.

## Staticfile buildpack

### Nginx:

- **Verified with:** The `gpg-rsa-key-id` and `gpg-signature` of the version. The `gpg-rsa-key-id` is the same for each version/build, but the `gpg-signature` is different. This information is located on the [Nginx Downloads](#) page.
- **Example:** Enqueueing binary build for Nginx 1.11.0.

## Binary buildpack

The Binary buildpack has no dependencies.

## Releasing a new Cloud Foundry buildpack version

You can update and release a new version of a Cloud Foundry (CF) buildpack through the CF Buildpacks Team Concourse [pipeline](#). Concourse is a continuous integration (CI) tool for software development teams. This process is used by the CF Buildpacks Team and other CF buildpack development teams. You can use this process as a model for using Concourse to build and release new versions of your own buildpacks.

The Concourse pipelines for Cloud Foundry buildpacks are located in the [buildpacks-ci](#) GitHub repository.

## Releasing a new buildpack version

To release a new buildpack version, do the following:

1. Download the `buildpacks-ci` repository:

```
$ git clone https://github.com/cloudfoundry/buildpacks-ci.git
```

2. From the buildpack directory, check out the `develop` branch of the buildpack:

```
$ cd /system/path/to/buildpack
$ git checkout develop
```

3. Make sure you have the most current version of the repository:

```
$ git pull -r
```

4. Run `bump` to update the version in the buildpack repository:

```
$ /system/path/to/buildpacks-ci/scripts/bump
```

5. Modify the `CHANGELOG` file manually to condense recent commits into relevant changes. For more information, see [Modify Changelogs](#).
6. Add and commit your changes:

```
$ git add VERSION CHANGELOG
$ git commit -m "Bump version to $(cat VERSION) [{insert story #}]"
```

7. Push your changes to the `develop` branch:

```
$ git push origin develop
```

## Concourse buildpack workflow

If `buildpacks-ci` is not deployed to Concourse, manually add a Git tag to the buildpack, and mark the tag as a release on GitHub.

If `buildpacks-ci` is deployed to Concourse, the buildpack update passes through the following life cycle:

1. Concourse starts the `buildpack-to-master` job in the pipeline for the updated buildpack. This job merges into the master or main branch of the buildpack.
2. The `detect-new-buildpack-and-upload-artifacts` job starts in the pipeline for the updated buildpack. This job creates a cached and uncached buildpack, and uploads them to an AWS S3 bucket.
3. The `specs-lts-master` and `specs-edge-master` jobs start and run the buildpack test suite, and the buildpack-specific tests of the [Buildpack Runtime Acceptance Tests \(BRATS\)](#).
4. If you use [Pivotal Tracker](#), paste the links for the `specs-edge-master` and `specs-lts-master` builds in the related buildpack release story, and deliver the story.
5. Your project manager can manually start the `buildpack-to-github` job on Concourse as part of the acceptance process. This releases the buildpack to GitHub.
6. After the buildpack has been released to GitHub, the `cf-release` pipeline is started using the manual initiation of the `recreate-bosh-lite` job in that pipeline. If the new buildpack has been released to GitHub, the CF that is deployed for testing in the `cf-release` pipeline is tested against that new buildpack.
7. After the `cats` job has successfully completed, your project manager can include the new buildpacks in the `cf-release` repository and create the new buildpack BOSH release by manually starting the `ship-it` job.

If errors occur during this workflow, you might need to remove unwanted tags. For more information, see [Handle Unwanted Tags](#).

## Modifying changelogs

The [Ruby buildpack changelog](#) shows an example layout, and content of a changelog. In general, changelogs follow these conventions:

- Reference public tracker stories whenever possible.

- Exclude unnecessary files.
- Combine and condense commit statements into individual stories containing valuable changes.

## Handling unwanted tags

If you encounter problems with the commit that contains the new version, change the target of the release tag by performing the following:

1. Verify that the repository is in a valid state and is building successfully.
2. Remove the tag from your local repository and from GitHub.
3. Start a build. The pipeline build script tags the build again if it is successful.

## Updating buildpack-related gems in Cloud Foundry

Learn how to update your [buildpack-packager](#) and [machete](#) CF buildpack test framework, which are used for CF system buildpack development.

The [buildpack-packager](#) packages buildpacks and [machete](#) provides an integration test framework.

The CF Buildpacks team uses the [gems-and-extensions pipeline](#) to:

- Run integration tests for [buildpack-packager](#) and [machete](#).
- Update the gems in the buildpacks managed by the team.

## Running the update process

The following steps assume you are using a Concourse deployment of the [buildpacks-ci](#) pipelines.

At the end of the process, there is a new GitHub release. Updates are then applied to the buildpacks.

To update the version of either gem in a buildpack:

1. Verify that the test job `<gemname>-specs` for the gem was updated successfully and ran on the commit you plan to update.
2. Start the `<gemname>-tag` job to update (“bump”) the version of the gem.  
The `<gemname>-release` job starts and creates a new GitHub release of the gem.
3. Each of the buildpack pipelines, for example, the [go-buildpack pipeline](#) has a job that watches for new releases of the gem. When a new release is detected, the buildpack’s `cf.Gemfile` is updated to that release version.
4. The commit made to the buildpack’s `cf.Gemfile` starts the full integration test suite for that buildpack.

The final step starts all buildpack test suites simultaneously, and causes contention for available shared BOSH lite test environments.

# Deploying apps

In this section:

- **Pushing apps to TAS for VMs**
  - Pushing your app using Cloud Foundry CLI (cf push)
  - Deploying with app manifests
  - App manifest attribute reference
  - Deploying an app with Docker
  - Deploying your large apps
  - Starting, restarting, and restaging apps
  - Pushing an app with multiple processes
  - Running cf push sub-step commands
  - Configuring app deployments
  - Pushing apps with sidecar processes
  - Using blue-green deployment to reduce downtime
  - Troubleshooting app deployment and health
- **Pushing apps to TAS for VMs [Windows]**
  - Deploying .NET apps
  - Using SMB volumes in .NET apps
  - Developing and pushing .NET Framework apps
- **Getting started deploying Java apps**
  - Getting started deploying your Grails apps
  - Getting started deploying Ratpack apps
  - Getting started deploying Spring apps

## Pushing apps to TAS for VMs

In this section:

- Pushing your app using Cloud Foundry CLI (cf push)
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- Deploying an app with Docker

- Deploying your large apps
- Starting, restarting, and restaging apps
- Pushing an app with multiple processes
- Running cf push sub-step commands
- Configuring app deployments
- Pushing apps with sidecar processes
- Using blue-green deployment to reduce downtime
- Troubleshooting app deployment and health

## Pushing your app using Cloud Foundry CLI (cf push)

The cf CLI command `cf push` pushes apps to TAS for VMs. There are two main ways to run the `cf push` command:

- Run `cf push APP-NAME` to push an app using default settings. For more information, see [Push with defaults](#).
- Run the `cf push` command with flags and helper files to customize:
  - How the pushed app runs, including its route, instance count, disk size limits, memory limits, and log rate limits
  - How push works: whether it's configured with a manifest, runs a startup script, or limits files uploaded to the Cloud Controller

For more information about custom settings, see [Push with custom settings](#).

For an explanation of what TAS for VMs does when you run `cf push`, see [How Apps are Staged](#).

For information about the life cycle of an app, see [Application container life cycle](#).

## Prerequisites

Before you push your app to TAS for VMs, ensure that:

- Your app is “cloud-ready.” TAS for VMs behaviors related to file storage, HTTP sessions, and port usage might require modifications to your app. To prepare an app to be pushed to TAS for VMs, see:
  - Considerations for designing and running an app in the cloud
  - Any [Buildpacks](#) guides specific to your app language or framework, such as [Getting started deploying Ruby on Rails apps](#)
- Your TAS for VMs deployment supports the type of app you are going to push, or you have the URL of an externally-available buildpack that can stage the app.
- All required app resources are uploaded. For example, you might need to include a database driver.
- You have your target and credentials:
  - The API endpoint for your TAS for VMs deployment. Also known as the target URL, this is the URL of the Cloud Controller in your TAS for VMs instance.

- Your user name and password for the TAS for VMs deployment.
- You are logged into your app’s target org and space.
  1. Decide the org and space where you want to push your app. You might have access to one or more org and space.
  2. Log in to this target org and space with `cf login`.
- Your app can access every service that it uses, because an instance of the service runs in, or is shared with, the app’s space.
  - For information about sharing service instances across spaces, see [Sharing service instances](#).
  - Typical services that cloud apps use include databases, message queues, and key-value stores.

## Push with defaults

To push an app with default settings:

1. Choose a name for the app. The app name must consist of alphanumeric characters and be unique to your TAS for VMs deployment.
  - To use an app name that is not unique, customize the app’s route as described in [Customize the route](#).
  - Apps running at their default routes require unique names because default routes are based on app names, and all routes must be globally unique.
2. Run:

```
cf push APP-NAME
```

Where `APP-NAME` is the name of the app.

## Default route

An app’s route is the URL at which it runs. TAS for VMs assembles the route for a pushed app from a host name and a domain.

By default, TAS for VMs sets the host name and domain as follows:

- **Hostname:** The name of the app name, as specified in the `cf push` command. If the app name contains underscores, TAS for VMs converts them to hyphens when creating the app’s route.
- **Domain:** The default apps domain for your TAS for VMs deployment.

For example, an app named `example-app` running on TAS for VMs with an apps domain `apps.example.com` runs at the URL `https://example-app.apps.example.com` by default.

For more information about routes and domains, see [Routes and domains](#).

## Example session

The following example output for `cf push example-app` demonstrates how TAS for VMs assigns default values to an app you push:

```
Creating app example-app in org example-org / space development as a.user@shared-domain.example.com...
OK

Creating route example-app.shared-domain.example.com...
OK

Binding example-app.shared-domain.example.com to example-app...
OK

Uploading example-app...
Uploading app: 560.1K, 9 files
OK

Starting app example-app in org example-org / space development as a.user@shared-domain.example.com...
----> Downloaded app package (552K)
OK
----> Using Ruby version: ruby-1.9.3
----> Installing dependencies using Bundler version 1.3.2
      Running: bundle install --without development:test --path vendor/bundle --binstubs vendor/bundle/bin --deployment
      Installing rack (1.5.1)
      Installing rack-protection (1.3.2)
      Installing tilt (1.3.3)
      Installing sinatra (1.3.4)
      Using bundler (1.3.2)
      Updating files in vendor/cache
      Your bundle is complete! It was installed into ./vendor/bundle
      Cleaning up the bundler cache.
----> Uploading droplet (23M)

1 of 1 instances running

App started

Showing health and status for app example-app in org example-org / space development as a.user@shared-domain.example.com...
OK

requested state: started
instances: 1/1
usage: 1G x 1 instances
urls: example-app.shared-domain.example.com

      state      since                  cpu    memory      disk      lo
gging
```

```
#0    running  2022-09-14 05:07:18 PM  0.0%  18.5M of 1G  52.5M of 1G  3  
B/s of 1M/s
```

## Push with custom settings

Pushing an app with custom settings typically proceeds as follows:

1. Customize Basic App Settings (Optional)
2. Customize the Route (Optional)
3. Limit the Upload Files (Optional)
4. Configure App Initialization (Optional)
5. Custom Push the App
6. Configure App Services (Optional)

The following sections detail these steps.

### Customize basic app settings (optional)

Basic settings to customize when pushing an app include:

- **Name:** You can use any series of alphanumeric characters as the name of your app.
- **Instances:** Generally speaking, the more app instances you run, the less downtime your app experiences. If your app is still in development, running a single instance can simplify troubleshooting. For any production app, VMware recommends a minimum of two instances.
- **Memory limit:** The maximum amount of memory that each instance of your app can consume. If an app instance exceeds this limit, TAS for VMs restarts the instance. If an app instance exceeds its memory limit repeatedly in a short period of time, TAS for VMs delays restarting the app instance.
- **Disk space limit:** The maximum amount of disk space that each instance of your app can consume. If an app instance exceeds this limit, TAS for VMs restarts the instance. If an app instance exceeds its disk space limit repeatedly in a short period of time, TAS for VMs delays restarting the app instance.
- **Log rate limit:** The maximum number of logs that each instance of your app can send to Loggregator. If an app instance exceeds this limit, TAS for VMs drops the excess logs and reports doing so.
- **Start command:** This is the command that TAS for VMs uses to start each instance of your app. This start command differs by app framework.

### Limit the upload files (optional)

By default, TAS for VMs uploads all app files except version control files and directories with names such as `.svn`, `.git`, and `_darcs`.

VMware recommends that you explicitly exclude extraneous files residing within your app directory, particularly if your app is large. For example, if you build your app locally and push it as a binary, you can save resources by not uploading any of the app's source code.

To exclude files from upload:

1. Create a `.cfignore` file that lists the files to exclude.
2. Save the `.cfignore` file to the directory where you run the `cf push` command.

For more information, see [Ignore Unnecessary Files When Pushing](#) in *Considerations for Designing and Running an App in the Cloud*.

## Configure app initialization (optional)

You can configure the `cf push` command to run custom initialization tasks for an app.

These tasks run after TAS for VMs loads the app droplet but before it starts the app to allow the initialization script to access the app language runtime environment. For example, your script can map values from `$VCAP_SERVICES` into other environment variables or a config file that the app uses.



The following notes include important information about configuring app initialization when you use certain buildpacks:

- **Java:** Initialization scripts for the Java buildpack require additional configuration. For more information, see [How to Modify the Application Container Environment prior to Application Execution](#) in the VMware Tanzu Knowledge Base.
- **PHP:** TAS for VMs does not support initialization scripts for the PHP buildpack versions prior to v4.3.18. If you use one of these buildpack versions, your app hosts the `.profile` script's contents. This means that any app staged using the affected buildpack versions can leak credentials placed in the `.profile` script.

To run initialization tasks:

1. Create a `.profile` script that contains the initialization tasks.
2. Save the `.profile` script to the directory where you run the `cf push` command.

The following example `.profile` file uses `bash` to set a value for the environment variable `LANG`:

```
# Set the default LANG for your apps
export LANG=en_US.UTF-8
```

Setting this value at the operating system level allows the app to find out which language to use for error messages and instructions, collating sequences, and date formats.

Your app root directory might also include a `.profile.d` directory that contains bash scripts that perform initialization tasks for the buildpack. Developers must not edit these scripts unless they are using a custom buildpack. For more information about custom buildpacks, see [Custom Buildpacks](#).

Initialization tasks as described here are also called *pre-runtime hooks* and *.profile tasks*.

## Custom push the app

To specify custom options when pushing an app with `cf push`, you can include them in one or both of the following:

- The `cf push` command itself.

- A manifest file.
  - The manifest file must be named `manifest.yml` and reside in the directory where you run `cf push`.
  - The manifest can include the app name, which lets you run `cf push` with no arguments.
  - The manifest can also include a `services` block that lists service instances for the app to bind. For more information, see [Services](#) in *App Manifest Attribute Reference*.

For information about how app settings change from push to push, including how command-line options, manifests, and commands like `cf scale` interact, see [Deploying with App Manifests](#).

For a full list of `cf push` options, enter `cf push --help`.

## Configure app services (optional)

If a newly-pushed app has the same name and route as an older app version, the new app retains the service bindings and service configuration of the previously-pushed version.

For apps that are not already set up for the services that they use:

1. Bind the services to the app. For more information about services, see [Services overview](#).
2. (Optional) Configure the app with the service URL and credentials, if needed. For more information, see [Configuring Service Connections](#).

## Build custom push workflows (optional)

The CF CLI includes [composable push sub-step commands](#) that empower you to build your own push. These are useful if the default behavior of `cf push` does not match your needs, or if you want to implement more complicated app build, promotion, and run workflows.

## App updates and downtime

By default, when you push an app that is already running, TAS for VMs stops all existing instances of that app. Users who try to access the app see a `404 Not Found` message while `cf push` runs.

When old and new versions of your app can run simultaneously, you can avoid app downtime by using [Rolling deployments](#). Alternatively, you can use the blue-green deployment method to swap routes between app versions running in parallel. For more information, see [Using blue-green deployment to reduce downtime and risk](#).

With some app updates, old and new versions of your code must never run at the same time. A worst-case example is if your app update migrates a database schema, causing old app instances to fail and lose user data. To prevent this, you must stop all running instances of your app before you push the new version.

## Troubleshoot app push problems

If your app does not start on TAS for VMs, first ensure that the app can run locally.

To troubleshoot your app in the cloud using the cf CLI, see [Troubleshoot app deployment and health](#).

## Deploying with app manifests

App manifests provide consistency and reproducibility, and can help you automate deploying apps. This topic provides basic procedures and guidance for deploying apps with a manifest file to VMware Tanzu Application Service for VMs (TAS for VMs). Both manifests and command line options allow you to override the default attribute values of `cf push`. These attributes include the number of app instances, disk space limit, memory limit, and log rate limit.

`cf push` follows rules of precedence when setting attribute values:

- Manifests override most recent values, including defaults and values set by commands such as `cf scale`.
- Command line options override manifests.
- The manifest configuration is additive and will not modify any unspecified properties or remove any existing environment variables, routes, or services.

For a full list of attributes you can specify in an app manifest, see [App manifest attribute reference](#).

## Deploy an app with a manifest

To deploy an app with a manifest:

1. Create a `manifest.yml` file in the root directory of your app. By default, the `cf push` command uses the `manifest.yml` file in the app directory. To specify a different location for the manifest, pass its local path to the `-f` flag when you run `cf push`.
2. Add the following content to the file:

```
---
applications:
- name: APP-NAME
```

Where `APP-NAME` is the name of your app.

3. Run:

```
cf push
```

If you specify any values with command-line flags, they override the values specified in the manifest. For more information, see [Deploy multiple apps with one manifest](#).

For more information about manifest format and attributes, see [App manifest attribute reference](#).

## Deploy multiple apps with one manifest

This section describes how to deploy multiple apps with a minimal manifest. For more information about manifest format and attributes, see [App manifest attribute reference](#).

### General rules

Follow these general rules when deploying multiple apps with one manifest:

- Use a `no-route` line in the description of any app that provides background services to another app.

- You cannot use any command line options with `cf push` except for `-f` and `--no-start`.
  - If your manifest is not named `manifest.yml` or not in the current working directory, use the `-f` command line option.
- To push a single app rather than all of the apps described in the manifest, provide the app name by running `cf push APP-NAME`, where `APP-NAME` is the name of your app.
- Each app must be in a subdirectory under the same parent directory.

## Procedure

To deploy multiple apps with a manifest:

1. Create a `manifest.yml` file in the directory that contains the apps.
2. Add each app and its directory to the file. TAS for VMs pushes the apps in the order specified in the manifest. If you push multiple apps using a manifest and one fails to deploy, TAS for VMs does not attempt to push apps specified after the app that failed.

```
---
applications:
- name: APP-ONE
  path: ./APP-ONE-DIRECTORY
- name: APP-TWO
  path: ./APP-TWO-DIRECTORY
```

Where:

- `APP-ONE` is the name of the first app you want TAS for VMs to push.
  - `APP-ONE-DIRECTORY` is the directory containing the first app.
  - `APP-TWO` is the name of the second app you want TAS for VMs to push.
  - `APP-TWO-DIRECTORY` is the directory containing the second app.
3. From the directory that contains the apps and the manifest, run:

```
cf push
```

## App manifest attribute reference

You can manage app properties and behavior using cf CLI commands or the app manifest (a YAML properties file). This topic describes manifest formatting and provides a list of attributes available for app manifests. You can use it with [Deploying with app manifests](#), which provides basic procedures and guidance for deploying apps with manifests.

For more information about V3 manifest properties, see the [Cloud Foundry API \(CAPI\) V3 documentation](#).

## Manifest format

Manifests are written in YAML. The following manifest illustrates some YAML conventions:

- The manifest begins with three dashes.

- The `version` property specifies a manifest schema version. This property is optional. For more information, see [Add schema version to a manifest](#).
- The `applications` block begins with a heading followed by a colon.
- The app `name` is preceded by a single dash and one space.
- Subsequent lines in the block are indented two spaces to align with `name`.

```
---
version: 1
applications:
- name: my-app
  memory: 512M
  instances: 2
```



If your app name begins with the dash character (-), you cannot interact with the app using the cf CLI. This is because the cf CLI interprets the dash as a flag.

## Add schema version to a manifest



This attribute is available with CAPI V3 only. To push a manifest that uses this attribute, do one of the following:

- Use cf CLI v7 or v8. See [Upgrading to cf CLI v7](#) or [Upgrading to cf CLI v8](#).
- Run `cf push APP-NAME`. Enter `cf help push` for information about this function.

You can specify the schema version in the `versions` property of the manifest. This property is optional.

The only supported version is `1`. If not specified, the default value for the `versions` property is `1`.

## Add variables to a manifest

You can use variables to create app manifests with values shared across all applicable environments in combination with references to environment-specific differences defined in separate files.

To add variables to an app manifest:

1. Create a file called `vars.yml`.
2. Add attributes to your `vars.yml` file. For example:

```
instances: 2
memory: 1G
```

3. Add the variables to your app manifest file using the following format: `((VARIABLE-NAME))`. For example:

```
---
applications:
- name: test-app
  instances: ((instances))
```

```

memory: ((memory))
buildpacks:
- go_buildpack
env:
  GOPACKAGENAME: go_calls_ruby
command: go_calls_ruby

```



You can also use variables for partial values. For example, you can specify `host` in your variables file and `- route: ((host)).env.com` in your manifest file.

#### 4. Run:

```
cf push --vars-file /PATH/vars.yml
```

Where `PATH` is the path to the file you created.

## Minimize duplication with YAML anchors

Top-level attributes are deprecated in favor of YAML anchors. For more information, see [Top-level attributes](#).

In manifests where multiple apps share settings or services, you might see duplicated content. While the manifests still work, duplication increases the risk of typographical errors, which cause deployments to fail.

You can declare shared configuration using a YAML anchor, to which the manifest refers in app declarations by using an alias.

```

---
defaults: &defaults
buildpacks:
- staticfile_buildpack
memory: 1G

applications:
- name: bigapp
  <: *defaults
- name: smallapp
  <: *defaults
  memory: 256M

```

In the example, manifest pushes two apps with the `staticfile` buildpack, `smallapp` and `bigapp`, with 256 M of memory for `smallapp` and 1 G of memory for `bigapp`.

## App attributes

This section explains how to describe optional app attributes in manifests. You can also specify each of these attributes using a command line option. Command-line options override the manifest.



In cf CLI v6, the route component attributes `domain`, `domains`, `host`, `hosts`, and `no-hostname` are deprecated in favor of the `routes` attribute. In cf CLI v7+, these attributes are removed. For more information, see `domain`, `domains`, `host`, `hosts`, and `no-hostname`.

## buildpacks

You can refer to a buildpack by name in a manifest or a command-line option. The `cf buildpacks` command lists the buildpacks that you can use.

- **Custom buildpacks:** If your app requires a custom buildpack, you can use the `buildpacks` attribute to specify it in a number of ways:
  - By name: `BUILDPACK`.
  - By GitHub URL: `https://github.com/cloudfoundry/java-buildpack.git`.
  - By GitHub URL with a branch or tag: `https://github.com/cloudfoundry/java-buildpack.git#v3.3.0` for the `v3.3.0` tag.

```
---  
...  
buildpacks:  
- buildpack_URL
```

- **Multiple buildpacks:** If you are using multiple buildpacks, you can provide an additional `-b` flag or add an additional value to your manifest:

```
---  
...  
buildpacks:  
- buildpack_URL  
- buildpack_URL
```



- This feature does not work with the deprecated `buildpack` attribute. For more information, see [buildpack](#).
- You must specify multiple buildpacks in the correct order: the buildpack uses the app start command given by the final buildpack. For more information, see the [multi-buildpack](#) repository on GitHub.

The `-b` command-line flag overrides this attribute.

For more information, see [Pushing an app with multiple buildpacks](#).

## command

Some languages and frameworks require that you provide a custom command to start an app. To find out if you need to provide a custom start command, see [Using Classic Buildpacks in Cloud Foundry](#).

You can provide the custom start command in your app manifest or on the command line. For more information about how TAS for VMs determines its default start command, see [Starting, restarting, and restaging apps](#).

To specify the custom start command in your app manifest, add it in the `command: START-COMMAND` format. For example:

```
---
...
command: bundle exec rake VERBOSE=true
```

The start command you specify becomes the default for your app. To return to using the original default start command set by your buildpack, you must explicitly set the attribute to `null`. For example:

```
---
...
command: null
```

On the command line, you can specify the custom start command by including the `-c` flag, similar to the following example:

```
cf push my-app -c "bundle exec rake VERBOSE=true"
```

The `-c` option with a value of `null` forces `cf push` to use the buildpack start command. For more information, see [Forcing cf push to use the Buildpack Start Command](#) in *Starting, restarting, and restaging apps*.

If you override the start command for a Buildpack app, Linux uses `bash -c COMMAND` to run your app. If you override the start command for a Docker app, Linux uses `sh -c COMMAND` to run your app. Because of this, if you override a start command, you must prefix `exec` to the final command in your custom composite start command.

An app must catch termination signals and clean up appropriately. Because of the way that shells manage process trees, the use of custom composite shell commands, particularly those that create child processes using `&`, `&&`, `||`, and so on, can prevent your app from receiving signals that are sent to the top-level bash process. For more information, see [Considerations for designing and running an app in the cloud](#).

To resolve this issue, you can use `exec` to replace the bash process with your own process.

For example:

- `bin/rake cf:on_first_instance db:migrate && bin/rails server -p $PORT -e $RAILS_ENV`: The process tree is bash -> ruby, so on graceful shutdown only the bash process receives the TERM signal, not the ruby process.
- `bin/rake cf:on_first_instance db:migrate && exec bin/rails server -p $PORT -e $RAILS_ENV`: Because of the `exec` prefix included on the final command, the Ruby process that is run by Rails takes over the bash process managing the execution of the composite command. The process tree is only Ruby, so the Ruby web server receives the TERM signal and can shut down gracefully for 10 seconds.

In more complex situations, like making a custom buildpack, you might want to use bash `trap`, `wait`, and background processes to manage your process tree and shut down apps gracefully. In most situations, however, a well-placed `exec` is sufficient.

## disk\_quota

The `disk_quota` attribute allocates the disk space for your app instance. This attribute requires a unit of measurement: `M`, `MB`, `G`, or `GB`, in either uppercase or lowercase.

For example:

```
---  
...  
disk_quota: 1024M
```

The `-k` command-line flag overrides this attribute.

## docker

If your app is contained in a Docker image, the `docker` attribute specifies it and an Docker user name (optional). This attribute is a combination of `push` options that include `--docker-image` and `--docker-username`.

For example:

```
---  
...  
docker:  
  image: docker-image-repository/docker-image-name  
  username: docker-user-name
```

The `--docker-image` or `-o` command-line flag overrides `docker.image`. The `--docker-username` command-line flag overrides `docker.username`.

The manifest attribute `docker.username` is optional. If it is used, the password must be provided in the environment variable `CF_DOCKER_PASSWORD`. If a Docker user name is specified, then a Docker image must also be specified.



Using the `docker` attribute with the `buildpacks` or `path` attributes causes an error.

## health-check-type

The `health-check-type` attribute sets the `health_check_type` flag to either `port`, `process` or `http`. If you do not provide a `health-check-type` attribute, the default is `port`.

For example:

```
---  
...  
health-check-type: port
```

The `-u` command-line flag overrides this attribute.

In cf CLI v6, the value of `none` is deprecated in favor of `process`. In cf CLI v7+, `none` is removed.

## health-check-http-endpoint

The `health-check-http-endpoint` attribute customizes the endpoint for the `http` health check type. If you do not provide a `health-check-http-endpoint` attribute, it uses endpoint `/`.

For example:

```
---  
...  
health-check-type: http  
health-check-http-endpoint: /health
```

## health-check-invocation-timeout

The `health-check-invocation-timeout` attribute specifies the timeout in seconds for individual health check requests for http and port health checks. The default value is 1.

For example:

```
---  
...  
health-check-invocation-timeout: 30
```

To override this attribute, run:

```
cf set-health-check APP-NAME http --invocation-timeout 10
```

Where `APP-NAME` is the name of your app.

Within the manifest, the health check invocation timeout is controlled by the `health-check-invocation-timeout` attribute.

## health-check-interval

The `health-check-interval` attribute specifies the amount of time in seconds between starting individual health check requests for HTTP and port health checks.

For example:

```
---  
...  
health-check-interval: 15
```

## readiness-health-check-type

The `readiness-health-check-type` attribute sets the readiness health check type to `port`, `process` or `http`. If you do not provide a `readiness-health-check-type` attribute, the default is `process`.

For example:

```
---  
...  
readiness-health-check-type: port
```

## readiness-health-check-http-endpoint

The `readiness-health-check-http-endpoint` attribute customizes the endpoint for the `http` readiness health check types. If you do not provide a `readiness-health-check-http-endpoint` attribute, it uses endpoint `/`.

For example:

```
---  
...  
readiness-health-check-type: http  
readiness-health-check-http-endpoint: /health
```

## readiness-health-check-invocation-timeout

The `readiness-health-check-invocation-timeout` attribute specifies the timeout in seconds for individual readiness health check requests for HTTP and port health checks. The default value is 1.

For example:

```
---  
...  
readiness-health-check-invocation-timeout: 30
```

## readiness-health-check-interval

The `readiness-health-check-interval` attribute specifies the amount of time in seconds between starting individual readiness health check requests for HTTP and port health checks.

For example:

```
---  
...  
readiness-health-check-interval: 15
```

## instances

The `instances` attribute configures the number of app instances.

For example:

```
---  
...  
instances: 2
```

The default number of instances is 1.

To ensure that platform maintenance does not interrupt your app, VMware recommends running at least two instances.

## lifecycle

The `lifecycle` attribute specifies which application lifecycle to use for staging and running the application. Three variants are supported at the moment:

- `buildpack`
- `docker`

For example:

```
---  
...  
lifecycle: buildpack
```

The default is `buildpack` unless the `docker` attribute is specified.

## log-rate-limit-per-second

The `log-rate-limit-per-second` attribute specifies the log rate limit for all instances of an app. This attribute requires a unit of measurement: `B`, `K`, `KB`, `M`, `MB`, `G`, or `GB`, in either uppercase or lowercase.

For example:

```
---  
...  
log-rate-limit-per-second: 24KB
```

To configure each app instance to send an unlimited number of logs to Loggregator, specify `-1`.

The default log rate limit is 16 K. If you know that your app instances do not require the default log rate limit, you might want to specify a smaller limit in your manifest to conserve quota space.

The `-1` command-line flag overrides this attribute.

## memory

The `memory` attribute specifies the memory limit for all instances of an app. This attribute requires a unit of measurement: `M`, `MB`, `G`, or `GB`, in either uppercase or lowercase.

For example:

```
---  
...  
memory: 1024M
```

The default memory limit is 1 G. If you know that your app instances do not require 1 G of memory, you might want to specify a smaller limit to conserve quota space.

The `-m` command-line flag overrides this attribute.

## metadata

The `metadata` attribute tags your apps with additional information. You can specify two types of metadata: `labels` and `annotations`. For more information, see [Types of metadata in Using Metadata](#).

For example:

```
metadata:  
  annotations:  
    contact: "bob@example.com jane@example.com"  
  labels:  
    sensitive: true
```

For more information about metadata, see [Using metadata](#).

## no-route



If you use the `no-route` flag attribute in the manifest or the flag option, it overrides all route-related attributes.

By default, `cf push` assigns a route to every app. But, some apps process data while running in the background and must not be assigned routes.

You can use the `no-route` attribute with a value of `true` to prevent a route from being created for your app.

For example:

```
---
...
no-route: true
```

The `--no-route` command-line flag overrides this attribute.

In the Diego architecture, `no-route` skips creating and binding a route for the app, but does not specify which type of health check to perform. If your app does not listen on a port because it is a worker or a scheduler app, then it does not satisfy the port-based health check, and TAS for VMs marks it as failed. To prevent this, deactivate the port-based health check by running:

```
cf set-health-check APP-NAME --process
```

Where `APP-NAME` is the name of your app.

To remove a route from an existing app:

1. Remove the route using the `cf unmap-route` command.
2. Push the app again with the `no-route: true` attribute in the manifest or the `--no-route` command line option.

For more information, see [Deploy multiple apps with one manifest](#) in *Deploying with App Manifests*.

## path

The `path` attribute tells TAS for VMs the directory location in which it can find your app. The directory specified as the `path`, either as an attribute or as a parameter on the command line, becomes the location where the buildpack `Detect` script runs.

For example:

```
---
...
path: /path/to/app/bits
```

The `-p` command-line flag overrides this attribute.

For more information, see [How cf push finds the app](#) in *Getting Started with the cf CLI*.

## processes



This attribute is available with CAPI V3 only. To push a manifest that uses this attribute, do one of the following:

- Use cf CLI v7 or v8. See [Upgrading to cf CLI v7](#) or [Upgrading to cf CLI v8](#).
- Run `cf push APP-NAME`. Enter `cf help push` for information about this function.

The `processes` attribute pushes apps that run multiple processes, such as a web app that has a UI process and a worker process.

For example:

```
processes:
- type: web
  command: start-web.sh
  disk_quota: 512M
  health-check-http-endpoint: /healthcheck
  health-check-type: http
  health-check-invocation-timeout: 10
  instances: 3
  memory: 500M
  timeout: 10
- type: worker
  command: start-worker.sh
  disk_quota: 1G
  health-check-type: process
  instances: 2
  memory: 256M
  timeout: 15
```

For detailed information about the process-level configuration, see the [CAPI documentation](#).

For more information about pushing an app with multiple processes, see [Pushing an app with multiple processes](#).

## random-route

If you push your app without specifying any route-related CLI options or app manifest flags, the cf CLI attempts to generate a route based on the app name, which can cause collisions.

You can use the `random-route` attribute to generate a unique route and avoid name collisions. When you use `random-route`, the cf CLI generates one of the following:

- An HTTP route with a random host, if no value is specified for `host`
- A TCP route with an unused port number.

For example:

```
---
...
random-route: true
```

The following example use cases demonstrate when you might use the `random-route` attribute:

- You deploy the same app to multiple spaces for testing purposes. In this situation, you can use `random-route` to randomize routes declared with the `route` attribute in the app manifest.
- You use an app manifest for a classroom training exercise in which multiple users deploy the same app to the same space.

The `--random-route` command-line flag overrides this attribute.

## routes

The `routes` attribute in the manifest provides multiple HTTP and TCP routes. Each route for this app is created if it does not already exist.



This attribute is a combination of `push` options that include `--hostname`, `-d`, and `--route-path` flags in v6. These flags are not supported in cf CLI v7, so the `routes` flag must be used.

You can specify the `protocol` attribute to configure which network protocol the route uses for app ingress traffic. This is optional. The available protocols are `http2`, `http1`, and `tcp`.



The `protocol` route attribute is available only for TAS for VMs deployments that use HTTP/2 routing. For information about configuring support for HTTP/2 in TAS for VMs, see [Configuring HTTP/2 Support](#).

For example:

```
---  
...  
routes:  
- route: example.com  
  protocol: http2  
- route: www.example.com/foo  
- route: tcp-example.com:1234
```

Under each route, you can optionally include an `options` attribute to configure per-route options as described in [Configuring per-route options](#).

Available options are:

- `loadbalancing` - defines how Gorouter distributes requests across the application backends. Valid values are `round-robin` and `least-connections`.

For example:

```
---  
...  
routes:  
- route: example.com  
  options:  
    loadbalancing: round-robin  
- route: example2.com
```

```
options:
  loadbalancing: least-connections
```

## Manifest attributes

If you use the `routes` attribute with the `host`, `hosts`, `domain`, `domains`, or `no-hostname` attributes, an error results.

### push flag options

This attribute has unique interactions with different command-line options. In cf CLI v7, several of the flags were removed (`--route-path`, `-d`, `--hostname`, `--no-hostname`)

Flag	Result
<code>--no-route</code>	All declared routes are ignored. This flag does not unbind all existing routes associated with the app.
<code>--random-route</code>	Sets or overrides the <code>HOSTNAME</code> in all HTTP routes. Sets or overrides the <code>PORT</code> in all TCP routes. The <code>PORT</code> and <code>HOSTNAME</code> are randomly generated.

## sidecars



This attribute is available with CAPI V3 only. To push a manifest that uses this attribute, do one of the following:

- Use cf CLI v7 or v8. See [Upgrading to cf CLI v7](#) or [Upgrading to cf CLI v8](#).
- Run `cf push APP-NAME`. Enter `cf help push` for information about this function.

The `sidecars` attribute specifies additional processes to run in the same container as your app. Each sidecar must have values for `name`, `process_types`, and `command`, whereas `memory` is optional.

For example:

```
sidecars:
- name: authenticator
  process_types: [ 'web', 'worker' ]
  command: bundle exec run-authenticator
  memory: 800M
- name: upcaser
  process_types: [ 'worker' ]
  command: ./tr-server
  memory: 900M
```

For more information about sidecars, see [Pushing apps with sidecar processes](#).

## stack

The `stack` attribute specifies the stack to which your app deploys.

For example:

```
---
...
stack: cflinuxfs4
```

To see a list of available stacks, run `cf stacks`.

The `-s` command-line flag overrides this attribute.

## timeout

The `timeout` attribute defines the number of seconds that TAS for VMs allocates for starting your app. It is related to the `health-check-type` attribute.

For example:

```
---
...
timeout: 80
```

You can increase the timeout length for very large apps that require more time to start. The default for the `timeout` attribute is `60`, but you can set it to any value up to the Cloud Controller's `cc.maximum_health_check_timeout` property.

`cc.maximum_health_check_timeout` has a maximum value of `600` seconds.

The `-t` command-line flag overrides this attribute.



If you configure `timeout` with a value greater than `cc.maximum_health_check_timeout`, the Cloud Controller reports a validation error with the maximum limit.

## Environment variables

The `env` block consists of a heading, then one or more environment variable/value pairs.

For example:

```
---
...
env:
  RAILS_ENV: production
  RACK_ENV: production
```

`cf push` deploys the app to a container on the server. The variables belong to the container environment.



- You must name variables with alphanumeric characters and underscores. Non-conforming variable names might cause unpredictable behavior.
- Do not use user-provided environment variables for security sensitive information such as credentials, because they might unintentionally show up in cf CLI output and Cloud Controller logs. Use [user-provided service instances](#) instead. The

system-provided environment variable `VCAP_SERVICES` is properly redacted for user roles such as Space Supporter and in Cloud Controller log files.

While the app is running, you can edit environment variables using one of these methods:

- To view all variables, run:

```
cf env APP-NAME
```

Where `APP-NAME` is the name of your app.

- To set an individual variable, run:

```
cf set-env APP-NAME VARIABLE-NAME VARIABLE-VALUE
```

Where:

- `APP-NAME` is the name of your app.
- `VARIABLE-NAME` is the environment variable you want to set.
- `VARIABLE-VALUE` is the value of the environment value.
- Removing an environment variable from the manifest YAML file is not sufficient to un-set it. To un-set an environment variable, run:

```
cf unset-env APP-NAME VARIABLE-NAME
```

Where:

- `APP-NAME` is the name of your app.
- `VARIABLE-NAME` is the environment variable you want to un-set.

Environment variables interact with manifests in the following ways:

- When you deploy an app for the first time, TAS for VMs reads the variables described in the environment block of the manifest and adds them to the environment of the container where the app is staged, and the environment of the container where the app is deployed.
- When you stop and then restart an app, its environment variables persist.

## Services

Apps can bind to services such as databases, messaging, and key-value stores.

Apps are deployed into app spaces. An app can only bind to services instances that exist in the target app space before the app is deployed.

The `services` block consists of a heading and one or more service instance names. The following ‘services’ attributes are allowed:

```
---
...
services:
  - service-1
  - name: service-2
```

```

- name: service-3
  parameters:
    key-1: value-1
    key-2: [value-2, value-3]
    key-3: ... any other kind of value ...
- name: service-4
  binding_name: binding-1

```

The person who creates the service chooses the service instance names. These names can convey logical information, describe the nature of the service, or neither.

For example:

```

---
...
services:
- instance_ABC
- instance_XYZ

```

You can bind an app to a service instance by setting the `VCAP_SERVICES` environment variable. For more information, see [Bind a service](#) in *Delivering Service Credentials to an App*.

## Deprecated app manifest features

This section describes app manifest features that are deprecated in favor of other features.



Running `cf push app -f manifest.yml` fails if your manifest uses any of these deprecated features with the feature that replaces it.

### Top-level attributes

Previously, you could declare top-level attributes, which are also known as global attributes. For example, you can move an attribute above the `applications` block, where it need appear only once.

The following example demonstrates how this was used to manage duplicated settings:

```

---
domain: shared-domain.example.com
memory: 1G
instances: 1
services:
- clockwork-mysql
applications:
- name: springtock
  host: tock09876
  path: ./spring-music/build/libs/spring-music.war
- name: springtick
  host: tick09875
  path: ./spring-music/build/libs/spring-music.war

```

Top-level attributes are deprecated in favor of YAML aliases.

The following example demonstrates how to specify a shared configuration using a YAML anchor, which the manifest refers to in app declarations by using an alias:

```
---
defaults: & defaults
  buildpacks:
    - staticfile_buildpack
  memory: 1G

applications:
- name: bigapp
  <: *defaults
- name: smallapp
  <: *defaults
  memory: 256M
```

When pushing the app, make explicit the attributes in each app's declaration. To do this, assign the anchors and include the app-level attributes with YAML aliases in each app declaration.

## domain, domains, host, hosts, and no-hostname attributes

These flags are removed in cf CLI v7+.

Previously, you could specify routes by listing them all at once using the `routes` attribute, or by using their hosts and domains.

For example:

```
---
applications:
- name: webapp
  host: www
  domains:
    - example.com
    - example.io
```

The following route component attributes are deprecated:

- `domain`
- `domains`
- `host`
- `hosts`
- `no-hostname`

You can only specify routes using the `routes` attribute:

```
---
applications:
- name: webapp
  routes:
    - route: www.example.com/foo
    - route: tcp.example.com:1234
```

## Inheritance

This feature is deprecated and replaced by variable substitution. For more information, see [Variable substitution](#).

With inheritance, child manifests inherit configurations from a parent manifest. The child manifests can use the inherited configurations as provided, extend them, or override them.

## buildpack

The singular `buildpack` attribute is deprecated. It is replaced by `buildpacks`, which specifies multiple buildpacks. For more information, see [buildpacks](#).

## Deploying an app with Docker

You can use the [Cloud Foundry Command Line Interface \(cf CLI\)](#) to push an app with a new or updated Docker image. VMware Tanzu Application Service for VMs (TAS for VMs) then uses the Docker image to create containers for the app.

For an explanation of how Docker works in TAS for VMs, see [Using Docker in TAS for VMs](#).

## Requirements

To push an app based on a Docker image, you need:

- A TAS for VMs deployment with Docker support activated. To enable Docker support, see the [Activate Docker](#) section of the [Using Docker in TAS for VMs](#) topic.
- A Docker image that meets the following requirements:
  - The Docker image must contain an `/etc/passwd` file with an entry for the `root` user. In addition, the home directory and the shell for that `root` user must be present in the image file system.
  - The total size of the Docker image file system layers must not exceed the disk quota for the app. The maximum disk allocation for apps is set by the Cloud Controller. The default maximum disk quota is 2048 MB per app.



If the total size of the Docker image file system layers exceeds the disk quota, the app instances do not start.

- The location of the Docker image on Docker Hub or another Docker registry.
- A registry that supports the Docker Registry HTTP API V2 and presents a valid certificate for HTTPS traffic. For more information, see the [Docker Registry HTTP API V2](#) spec in the Docker documentation.

## Requirement for cf ssh support

To log in to your application container using the `cf ssh` command, you must make a shell such as `sh` or `bash` available in the container.

The SSH server in the container looks for the following executables in absolute locations or the `PATH` environment variable:

- `/bin/bash`
- `/usr/local/bin/bash`
- `/bin/sh`
- `bash`
- `sh`

## Benefits of specifying tags

To make your application container consistent after platform updates and code changes, specify a tag when you push your Docker image. Otherwise, the platform applies the `latest` tag without respecting changes to `PORT` or `ENTRYPOINT`.

If you push your Docker image without specifying a tag, you must run `cf restage` for the changes to take effect.

## Port configuration

By default, apps listen for connections on the port specified in the `PORT` environment variable for the app. TAS for VMs allocates this value dynamically.

When configuring a Docker image for TAS for VMs, you can control the exposed port and the corresponding value of `PORT` by specifying the `EXPOSE` directive in the image Dockerfile. If you specify the `EXPOSE` directive, then the corresponding app pushed to TAS for VMs listens on that exposed port. For example, if you set `EXPOSE` to `7070`, then the app listens for connections on port 7070.

If you do not specify a port in the `EXPOSE` directive, then the app listens on the value of the `PORT` environment variable as determined by TAS for VMs.

If you set the `PORT` environment variable via an `ENV` directive in a Dockerfile, TAS for VMs overrides the value with the system-determined value.

TAS for VMs supports only one exposed port on the image.

For more information about the `PORT` environment variable, see the `PORT` section of *TAS for VMs Environment variables*. For more information about the `EXPOSE` directive, see the `EXPOSE` in the Docker documentation.

## Start command

By default, Docker uses the start command specified by the `CMD` and/or `ENTRYPOINT` directives in the Docker image. You can override the start command either by using the `-c` flag on `cf push` or by setting the `command` property in a manifest file.

## Push a Docker image from a registry

TAS for VMs supports pushing apps from container registries such as Docker Hub, Google Container Registry (GCR), and Amazon Elastic Container Registry (ECR).

How you run `cf push` with apps stored in container registries depends on which registry you use and how it authenticates requests for the container image.

The following sections explain how to push apps under different container registry scenarios.

## Docker Hub

To deploy a Docker image from a Docker Hub repository, run:

```
cf push APP-NAME --docker-image REPO/IMAGE:TAG
```

Where:

- `APP-NAME` is the name to give the pushed app on TAS for VMs.
- `REPO` is the name of the repository where the image is stored.
- `IMAGE` is the name of the app image on Docker Hub.
- (Optional, but recommended) `TAG` is the tag or version for the image.

For example, the following command pushes the `your-image` image from Docker Hub to a TAS for VMs app:

```
cf push your-app --docker-image cloudfoundry/your-image
```

## Private container registry without authentication

As an alternative to Docker Hub, you can use any Docker image registry that presents a valid certificate for HTTPS traffic, such as a company-internal Docker registry.

To push an app as a Docker image using a specified Docker registry, run:

```
cf push APP-NAME --docker-image YOUR-PRIVATE-REGISTRY.DOMAIN:PORT/REPO/IMAGE:TAG
```

Where:

- `APP-NAME` is the name to give the pushed app on TAS for VMs.
- `YOUR-PRIVATE-REGISTRY.DOMAIN` is the path to the Docker registry.
- `PORT` is the port where the registry serves traffic.
- `REPO` is the name of the repository where the image is stored.
- `IMAGE` is the name of the app image being pushed.
- (Optional, but recommended) `TAG` is the tag or version for the image.

For example, the following command pushes the `v2` version of the `your-image` image from the `your-repo` repository of the `internal-registry.example.com` registry on port `5000`:

```
cf push your-app --docker-image internal-registry.example.com:5000/your-repo/your-image:v2
```

## Private container registry with basic authentication

Many Docker registries control access to Docker images by authenticating with a user name and password.

To push an app as a Docker image from a registry that uses basic user name and password authentication, run:

```
CF_DOCKER_PASSWORD=YOUR-PASSWORD cf push APP-NAME --docker-image REPO/IMAGE:TAG --docker-username USER
```

Where:

- `YOUR-PASSWORD` is the password to use for authentication with the Docker registry.
  - Setting `CF_DOCKER_PASSWORD` prepended to the `cf push --docker-image` makes the value temporary, which is more secure than setting the environment variable indefinitely with `export`.
- `APP-NAME` is the name to give the pushed app on TAS for VMs.
- `REPO` is the repository where the image is stored.
  - For Docker Hub, this is just the repository name.
  - For a private registry, this includes the registry address and port, as described in [Push a Docker image from a private registry](#), in the format `YOUR-PRIVATE-REGISTRY.DOMAIN:PORT/REPO`.
- `IMAGE` is the name of the app image being pushed.
- (Optional, but recommended) `TAG` is the tag or version for the image.
- `USER` is the user name to use for authentication with the registry.

If container registry credentials change, you have two options for an update: either you push the app with the new credentials or you update the latest package with the new credentials using [PATCH /v3/packages](#) and then restage your app. Apps require access to the container registry when starting. If you do not update the app with the new credentials, TAS for VMs fails to start the app. When you rotate container credentials, VMware recommends using a set of two credentials, where the `old` credentials can be deactivated after all apps are pushed with the `new` credentials.

## Amazon Elastic Container Registry (ECR)

TAS for VMs supports pushing apps from images hosted on Amazon Web Services ECR, which authenticates with temporary password tokens.

To push an app as a Docker image from ECR, run:

```
CF_DOCKER_PASSWORD=AWS-SECRET-ACCESS-KEY cf push APP-NAME --docker-image REPO/IMAGE:TAG --docker-username AWS-ACCESS-KEY-ID
```

Where:

- `AWS-SECRET-ACCESS-KEY` is the AWS Secret Access Key for the IAM user accessing the ECR registry.
  - Setting `CF_DOCKER_PASSWORD` prepended to the `cf push --docker-image` makes the value temporary, which is more secure than setting the environment variable indefinitely with `export`.

- `APP-NAME` is the name to give the pushed app on TAS for VMs.
- `REPO` is the ECR repository containing the image being pushed.
- `IMAGE` is the name of the app image being pushed.
- (Optional, but recommended) `TAG` is the tag or version for the image.
- `AWS-ACCESS-KEY-ID` is the AWS Access Key ID for the IAM user accessing the ECR registry.

Running `cf push` with an ECR registry triggers TAS for VMs to:

1. Use the AWS Secret Access Key and Access Key ID to retrieve the temporary ECR user name and password.
2. Use the temporary tokens to retrieve the image.

## Google Container Registry (GCR)

TAS for VMs supports pushing apps from images hosted on Google Container Registry (GCR) service. This feature requires that you use JSON key-based authentication. For more information about JSON key authentication, see the [Google Cloud documentation](#).

### Step 1: Authenticate with GCR

To authenticate with GCR, you must create a JSON key file and associate it with your project.

To create a JSON key file and associate it with your project:

1. Create a GCP service account. To create a GCP service account, see the [Google Cloud documentation](#). Run:

```
gcloud iam service-accounts create YOUR-ACCOUNT --display-name "YOUR-DISPLAY-NAME"
```

Where:

- `YOUR-ACCOUNT` is the name of your service account.
- `YOUR-DISPLAY-NAME` is the display name of your service account.

2. Set your project ID by running:

```
gcloud config set project YOUR-PROJECT-ID
```

Where `YOUR-PROJECT-ID` is your project ID.

3. Create a JSON key file and associate it with the service account by running:

```
gcloud iam service-accounts keys create key.json --iam-account=YOUR-ACCOUNT@YOUR-PROJECT-ID.iam.gserviceaccount.com
```

Where:

- `YOUR-ACCOUNT` is the name of your service account.
- `YOUR-PROJECT-ID` is your project ID.

- Add the IAM policy binding for your project and service account by running:

```
gcloud projects add-iam-policy-binding YOUR-PROJECT --member serviceAccount:YOUR-ACCOUNT@YOUR-PROJECT-ID.iam.gserviceaccount.com --role roles/storage.objectViewer
```

Where:

- `YOUR-PROJECT` is the name of your project.
- `YOUR-ACCOUNT` is the name of your service account.
- `YOUR-PROJECT-ID` is your project ID.

## Step 2: Deploy the GCP image

To deploy your GCR image using the cf CLI, run:

```
CF_DOCKER_PASSWORD=$(cat key.json) cf push APP-NAME --docker-image docker://YOUR-REGISTRY-URL/YOUR-PROJECT/YOUR-IMAGE-NAME --docker-username _json_key`
```

Where:

- `APP-NAME` is the name of the app being pushed.
- `YOUR-REGISTRY-URL` is the URL of your registry.
- `YOUR-PROJECT` is the name of your project.
- `YOUR-IMAGE-NAME` is the name of your image.
- The `key.json` file must point to the file you created earlier.



For information about specifying `YOUR-REGISTRY-URL`, see [Pushing and Pulling Images](#) in the Google Cloud documentation.

## Docker volume support

You can use volume services with Docker apps. For more information about enabling volume support, see [Using an external file system \(volume services\)](#).

## Deploying your large apps

When you deploy apps larger than 750 MB to VMware Tanzu Application Service for VMs (TAS for VMs), you must observe additional constraints and recommended settings.

## Deployment considerations and limitations

Deployment involves uploading, staging, and starting the app. For more information about the default time limits for uploading, staging, and starting an app, see [Deployment](#) in *Application container life cycle*.

To deploy large apps to TAS for VMs, ensure that:

- The total size of the files to upload for your app does not exceed the maximum app file size that an admin sets in the **App Developer Controls** pane of the TAS for VMs tile.
- Your network connection speed is sufficient to upload your app within the 15-minute limit. The minimum recommended speed is 874 KB per second. TAS for VMs provides an authorization token that is valid for a minimum of 20 minutes.
- You allocate enough memory for all instances of your app. Use either the `-m` flag with `cf push` or set an app memory value in your `manifest.yml` file.
- You allocate enough disk space for all instances of your app. Use either the `-k` flag with `cf push` or set a disk space allocation value in your `manifest.yml` file.
- You allocate enough log quota for all instances of your app. Use either the `-l` flag with `cf push` or set a log rate limit in your `manifest.yml` file.
- If you use an app manifest file, `manifest.yml`, specify adequate values for your app for attributes such as app memory, app start timeout, and disk space allocation. For more information about using app manifests, see [Deploying with app manifests](#).
- The size of each environment variable for your app does not exceed 130 KB. This includes TAS for VMs system environment variables such as `VCAP_SERVICES` and `VCAP_APPLICATION`. For more information, see [TAS for VMs environment variables](#).
- You push only the files that are necessary for your app. To meet this requirement, push only the directory for your app, and remove unneeded files or use the `.cfignore` file to specify excluded files. For more information about specifying excluded files, see [Ignore unnecessary files when pushing](#) in *Considerations for Designing and Running an App in the Cloud*.
- You configure Cloud Foundry Command Line Interface (cf CLI) staging, startup, and timeout settings to override settings in the manifest, as necessary:
  - `CF_STAGING_TIMEOUT`: The maximum time in minutes that the cf CLI waits for an app to stage after TAS for VMs uploads and packages the app.
  - `CF_STARTUP_TIMEOUT`: The maximum time in minutes that the cf CLI waits for an app to start
  - `cf push -t TIMEOUT`: The maximum time in seconds that TAS for VMs allows to elapse between starting an app and the first healthy response from the app. When you use this flag, the cf CLI ignores any app start timeout value set in the manifest.

For more information about using the cf CLI to deploy apps, see [Push](#) in *Getting Started with the cf CLI*.



Changing the timeout setting for the cf CLI does not change the timeout limit for TAS for VMs server-side jobs such as staging or starting apps. You must change server-side timeouts in the manifest. Because of the differences between the TAS for VMs and cf CLI timeout values, your app might start even though the cf CLI reports `App failed`. To review the status of your app, run `cf apps APP-NAME`, where `APP-NAME` is the name of your app.

## Default settings and limitations summary

The following table provides a summary of the constraints and default settings to consider when you deploy a large app to TAS for VMs:

Setting	Note
App package size	Maximum: Set in the <b>App Developer Controls</b> pane of the TAS for VMs tile
Authorization token grace period	Default: 20 minutes, minimum
<code>CF_STAGING_TIMEOUT</code>	cf CLI environment variable Default: 15 minutes
<code>CF_STARTUP_TIMEOUT</code>	cf CLI environment variable Default: 5 minutes
<code>cf push -t TIMEOUT</code>	App start timeout maximum Default: 60 seconds
Disk space allocation	Default: 1024 MB
Internet connection speed	Recommended minimum: 874 KB per second

## Starting, restarting, and restaging apps

You can start, restart, and restage apps in Cloud Foundry, using the cf CLI or the app manifest (attributes in a YAML file).

### Start your app

To start your app, run the following command from your app root directory:

```
$ cf push YOUR-APP
```

For more information about pushing apps, see [Pushing an app](#).

Cloud Foundry determines the start command for your app from one of these three sources:

- The `-c` command-line option in the Cloud Foundry Command Line Interface (cf CLI). For example:

```
$ cf push YOUR-APP -c "node YOUR-APP.js"
```

- The `command` attribute in the app manifest. For example:

```
command: node YOUR-APP.js
```

- The buildpack, which provides a start command appropriate for a particular type of app.

The source that Cloud Foundry uses depends on factors that are explained in the next section.

### How Cloud Foundry determines its default start command

The first time you deploy an app, `cf push` uses the buildpack start command by default. After that, `cf push` defaults to whatever start command was used for the previous push.

To override these defaults, provide the `-c` option, or the command attribute in the manifest. When you provide start commands both at the command line and in the manifest, `cf push` ignores the command in the manifest.

## Forcing Cloud Foundry to use the buildpack start command

To force Cloud Foundry to use the buildpack start command, specify a start command of `null`.

You can specify a null start command in one of two ways.

- Using the `-c` command-line option in the cf CLI:

```
$ cf push YOUR-APP -c "null"
```

- Using the `command` attribute in the app manifest:

```
command: null
```

This can be helpful after you have deployed while providing a start command at the command line or the manifest. Now a command that you provided, rather than the buildpack start command, has become the default start command. In this situation, if you decide to deploy using the buildpack start command, the `null` command simplifies that.

## Start commands when migrating a database

Start commands are used in special ways when you migrate a database as part of an app deployment. For more information, see [Services overview](#).

## Restart your app

To restart your app, run:

```
$ cf restart YOUR-APP
```

Restarting your app stops your app and restarts it with the already compiled droplet. A droplet is a tarball that includes:

- stack
- [buildpack](#)
- app source code

The Diego `cell` unpacks, compiles, and runs a droplet on a container.

Restart your app to refresh the app's environment after actions such as binding a new service to the app or setting an environment variable that only the app consumes. However, if your environment variable is consumed by the buildpack in addition to the app, then you must [restage](#) the app for the change to take effect.

## Restage your app

To restage your app, run:

```
$ cf restage YOUR-APP
```

Restaging your app stops your app and restages it, by compiling a new droplet and starting it.

Restage your app if you have changed the environment in a way that affects your staging process, such as setting an environment variable that the buildpack consumes. Staging has access to environment variables, so the environment can affect the contents of the droplet. You must also restage your app whenever you edit any configuration settings, such as when you rename it, add metadata, or configure health checks. The new settings often do not take effect until you restage the app.

Restaging your app compiles a new droplet from your app without updating your app source. If you must update your app source, re-push your app by following the steps in [Start your app](#).

## Pushing an app with multiple processes

The Cloud Foundry API (CAPI) V3 supports using a single command to push apps that run multiple processes, such as a web app that has a UI process and a worker process. You can push an app with multiple processes using either a manifest or a Procfile.

For more information about processes, see the [CAPI V3 documentation](#).

## Push an app with multiple processes using a manifest

To push an app with multiple processes using a manifest:

1. Create a file in YAML format that defines a manifest. Include each process with its start command.

This example manifest file defines the app `example-app` with two processes:

```
version: 1
- name: example-app
  processes:
    - type: web
      command: bundle exec rackup config.ru -p $PORT
      instances: 3
    - type: worker
      command: bundle exec rake worker:start
      health-check-type: process
      instances: 2
```

2. Push the app with your manifest by running:

```
cf push -f MANIFEST.yml
```

Where `MANIFEST` is the filename of your manifest file.

For more information about defining processes with manifests, see [processes in App Manifest Attribute Reference](#).

## Push an app with multiple processes using a Procfile

Procfile support varies depending on the buildpack you use. For example, the Staticfile buildpack requires a Staticfile instead of a Procfile. For more information, see [Staticfile Buildpack](#)

To push an app with multiple processes using a Procfile:

1. Create a file named `Procfile` in the root of your app directory. For more information about Procfiles, see the [CAPI V3 documentation](#).
2. Add each process and its start command to the Procfile. For example:

```
web: bundle exec rackup config.ru -p $PORT
worker: bundle exec rake worker:start
```

3. Push the app by running:

```
cf push APP-NAME
```

Where `APP-NAME` is the name of your app.

By default, the web process has a route and one instance. Other processes have zero instances by default.

## Scale a process

To scale an app process:

1. Run:

```
cf scale APP-NAME --process PROCESS-NAME -i INSTANCE-COUNT
```

Where:

- `APP-NAME` is the name of your app.
- `PROCESS-NAME` is the name of the process you want to scale.
- `INSTANCE-COUNT` is the number of instances to which you want to scale the process.

## View processes

To view the processes running as part of an app:

1. Run:

```
cf app APP-NAME
```

Where `APP-NAME` is the name of your app.

The following example shows return output for an app that has a `web` and a `worker` process:

```
Showing health and status for app example-app in org test / space test
as admin...

name:           example-app
requested state: started
routes:         example-app.cloudfoundry.example.com
last uploaded:   Wed 17 Jul 22:57:04 UTC 2024
stack:          cflinuxfs3
buildpacks:
```

name	version	detect	output	buildpack name
ruby_buildpack	1.8.57	ruby		ruby
type:				
sidecars:				
instances:	1/1			
memory usage:	1024M			
state	since	cpu	memory	disk
logging	cpu entitlement details			
#0 running	2024-07-17T22:57:22Z	0.3%	49.5M of 1G	130.2M of 1G
0B/s of 16K/s	2.4%			
type:	worker			
sidecars:				
instances:	2/2			
memory usage:	1024M			
state	since	cpu	memory	disk
logging	cpu entitlement details			
#0 running	2024-07-17T22:57:22Z	0.3%	49.5M of 1G	130.2M of 1G
0B/s of 16K/s	2.4%			
#0 running	2024-07-17T22:57:22Z	0.3%	49.5M of 1G	130.2M of 1G
0B/s of 16K/s	2.4%			



To avoid security exposure, ensure that you migrated your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

## Running cf push sub-step commands

The Cloud Foundry Command Line Interface (cf CLI) includes commands that provide detailed control over app pushes. When you use these commands, you can follow only some steps of the `cf push` procedure or you can perform specific actions between the steps that are normally part of running `cf push`.

Here are some example use cases for the sub-step commands:

- Updating a third-party system before staging an app
- Retrying failed stagings without incurring downtime
- Calling external services to report audit data during push
- Scanning a droplet before deploy
- Integrating with a change request system
- Running droplets built on a different Cloud Foundry deployment

To support these custom push workflows, Cloud Foundry divides apps into smaller building blocks.

The following table describes the building blocks as resources and lists the command associated with each one.

For information about using these commands, see [Example workflows](#).

Resource	Description	Commands
App	The top-level resource that represents an app and its configuration. For more information, see <a href="#">Apps</a> in the CAPI documentation.	<ul style="list-style-type: none"> <li>• <code>cf app</code></li> <li>• <code>cf apps</code></li> <li>• <code>cf create-app</code></li> </ul>
Package	The source code that makes up an app. For more information, see <a href="#">Packages</a> in the CAPI documentation.	<ul style="list-style-type: none"> <li>• <code>cf create-package</code></li> <li>• <code>cf packages</code></li> </ul>
Build	Staging the app. Creating a build combines a Package with a Buildpack and builds it into an executable resource, called a Droplet. For more information, see <a href="#">Builds</a> in the CAPI documentation.	<ul style="list-style-type: none"> <li>• <code>cf stage-package</code></li> </ul>
Droplet	An executable resource that results from a Build. For more information, see <a href="#">Droplets</a> in the CAPI documentation.	<ul style="list-style-type: none"> <li>• <code>cf download-droplet</code></li> <li>• <code>cf droplets</code></li> <li>• <code>cf set-droplet</code></li> </ul>
Manifest	A file used when pushing your app to apply bulk configuration to an app and its underlying processes. For more information, see <a href="#">Space Manifest</a> in the CAPI documentation.	<ul style="list-style-type: none"> <li>• <code>cf apply-manifest</code></li> <li>• <code>cf create-app-manifest</code></li> </ul>

## Example workflows

The following sections describe example workflows for working with the `cf push` sub-step commands.

### Push an app using sub-step commands

This example workflow describes how to push an app using sub-step commands instead of `cf push`.

1. Create your app with `cf CLI`:

```
cf create-app APP-NAME
```

Where `APP-NAME` is the name you give your app.

2. From your app directory, create a package for your app.

```
cf create-package APP-NAME
```

Where `APP-NAME` is the name of your app.

3. Locate and copy the `package guid` from the output of an earlier step or by using the `cf packages` command. See the following example output:

```
Uploading and creating bits package for app APP-NAME in org test / space test as admin...
package guid: 0dfca85a-8ed4-4f00-90d0-3ab08852dba8
OK
```

4. Stage the package you created:

```
cf stage-package APP-NAME --package-guid PACKAGE-GUID
```

Where:

- `APP-NAME` is the name of your app.
- `PACKAGE-GUID` is the package GUID you recorded in an earlier step.

5. Locate and copy the `droplet guid` from the output of an earlier step or by using the `cf droplets` command. See the following example output:

```
Staging package for APP-NAME in org test / space test as admin...
...
Package staged
droplet guid: f60d3464-415a-4202-9d40-26a70373a487
state: staged
created: Mon 25 Sep 16:37:45 PDT 2018
```

6. Assign the droplet to your app:

```
cf set-droplet APP-NAME DROPLET-GUID
```

Where:

- `APP-NAME` is the name of your app.
- `DROPLET-GUID` is the droplet GUID you recorded in an earlier step.

7. Start your app:

```
cf start APP-NAME
```

Where `APP-NAME` is the name of your app.

## Roll back to a previous droplet

This example workflow describes how to roll back to a previous droplet used by your app. You might want to use this, for example, if you update your app and it has a bug that causes it to fail.

1. List the droplets for your app:

```
cf droplets APP-NAME
```

Where `APP-NAME` is the name of your app.

2. In the output, locate and copy the second-to-last GUID.

In the following example, this is `66524145-5502-40e6-b782-47fe68e13c49`.

```
Listing droplets of app APP-NAME in org test / space test as admin...
```

guid	state	created
66524145-5502-40e6-b782-47fe68e13c49	staged	Mon 25 Sep 16:37:34 PDT

2018

```
0677ad93-9f77-4aaa-9a6b-44da022dcd58 staged Mon 25 Sep 16:44:55 PDT
2018
```

3. Stop your app:

```
cf stop APP-NAME
```

If you wish to avoid incurring downtime when changing your droplet, consider using [Rolling deployments](#) instead of stopping and starting your app.

4. Set the app to use the previous droplet:

```
cf set-droplet APP-NAME PREVIOUS-DROPLET-GUID
```

Where:

- `APP-NAME` is the name of your app.
- `PREVIOUS-DROPLET-GUID` is the droplet GUID you recorded in an earlier step.

5. Start your app:

```
cf start APP-NAME
```

Where `APP-NAME` is the name of your app.

## Downloading and uploading droplets

This example workflow describes how to download a built droplet and then push it to an app. You might want to use this for building apps in one location and then deploying it elsewhere. For instance, you might use this to promote built apps from pre-production environments to production environments without having to re-build the app.

1. Download the current droplet for your app:

```
cf download-droplet APP-NAME --path PATH
```

Where `APP-NAME` is the name of your app and `PATH` is the file path to download the droplet to.

2. Log in to the desired Cloud Foundry environment and target the organization and space where you want to run the droplet you downloaded.
3. Push a new or existing app with the downloaded droplet:

```
cf push APP-NAME --droplet PATH
```

Where `APP-NAME` is the name of your app and `PATH` is the file path to the downloaded droplet.

## Configuring app deployments

You can use Cloud Foundry Command Line Interface (cf CLI) commands or the Cloud Foundry API (CAPI) to push your apps to VMware Tanzu Application Service for VMs (TAS for VMs) using a deployment.

For information about the traditional method for addressing app downtime while pushing app updates, see [Using blue-green deployment to reduce downtime and risk](#).

For more information about CAPI, see the [Cloud Foundry API \(CAPI\) documentation](#).

## Prerequisites

The procedures in this topic require one of the following:

- [cf CLI v7 or later](#)
- [CAPI V3](#): If you use CAPI V3 API, you must install the cf CLI.

Or for canary deployments:

- [cf CLI v8.8.0 or later](#)
- [CAPI V3.173.0 or later](#)

## How Deployment Strategies Work

Cloud Foundry provides two different strategies for deployments:

1. Rolling deployments bring up one or more web processes (as defined by `max-in-flight`) at a time. After those instances report healthy and routable, the deployment brings down an equivalent number instances of the old revision. The deployment repeats this process until all instances have been replaced, and finally replaces all old non-web processes with new processes before finishing.
2. Canary deployments bring up a single web process of the new revision, then pause indefinitely. This gives time for app operators or developers to evaluate the health of a new revision. After evaluating the effects, app operators can choose to either `cancel` or `continue` the deployment. When the deployment is continued, the canary deployment proceeds in a way similar to a rolling deployment.

The following sections describe these deployment strategies and their limitations in detail.

## Rolling Deployments

This section describes pushing an app with the rolling deployment strategy.

1. The `cf push APP-NAME --strategy rolling` command:
  1. Stages the updated app package.
  2. Creates a droplet with the updated app package.
  3. Creates a deployment with the new droplet and any new configuration.
    - This starts up to `max_in_flight` processes that shares the route with the old process.
    - If you run `cf app` on your app at this point, you see multiple `web` processes. For more information about the deployment object, see the [Deployments](#) section of the CAPI V3 documentation.
2. After the command creates the deployment, the `cc_deployment_updater` BOSH job runs in the background, updating deployments as follows:

1. Adds up to `max_in_flight` instances of the new web process and removes instances from the old web process. This step repeats until the new web process reaches the required number of instances.



This happens only if all instances of the new web process are running.

2. Removes the old web process. The new web process now fully replaces the old web process.
3. Restarts all non-web processes of the app.
4. Sets the deployment to `DEPLOYED`.

## Canary Deployments

This section describes pushing an app with the canary deployment strategy.

1. The `cf push APP-NAME --strategy canary` command:
  1. Stages the updated app package.
  2. Creates a droplet with the updated app package.
  3. Creates a deployment with the new droplet and any new configuration.  
For more information about the deployment object, see the [Deployments](#) section of the CAPI V3 documentation.
2. After the command creates the deployment, the `cc_deployment_updater` BOSH job runs in the background, updating deployments as follows:
  1. Adds one instance of the new web process (the `canary` instance).
    - This process shares routes with the old process.
    - If you run `cf app` on your app at this point, you see multiple `web` processes.
  2. Sets the deployment to `PAUSED`.
3. After validating that the canary instance is running as expected, execute the command `cf continue-deployment APP-NAME`:
  - Changes the deployment reason to `DEPLOYING` and resumes in a way similar to that of a rolling deployment.
4. After the command changes the status of the deployment, the `cc_deployment_updater` BOSH job runs in the background, updating deployments as follows:
  1. Adds MaxInFlight number of instances (**by default it is 1**) of the new web process and removes MaxInFlight number of instance from the old web process. This step repeats until the new web process reaches the required number of instances.



This happens only if all instances of the new web process are running.

2. Removes the old web process. The new web process now fully replaces the old web process.

3. Restarts all non-web processes of the app.
4. Sets the deployment to `DEPLOYED`.

## Limitations

The following table describes the limitations when using these deployments.

Limitation	Description
Multiple app versions	During a deployment, TAS for VMs serves both the old and new version of your app at the same route. This can lead to user issues if you push API changes that are not backwards-compatible.
Database migrations	Deployments do not handle database migrations. Migrating an app database when the existing app is not compatible with the migration can result in downtime.
Non-web processes	Deployments only run web processes through the update sequence described earlier. The commands <code>restart worker</code> and other non-web processes in bulk after updating all web processes.
	The CAPI V3 API introduces the concept of processes as runnable units of an app. Each app has a web process by default. You can specify additional processes with a Procfile, and in some cases buildpacks create additional processes. For more information about processes, see <a href="#">Processes</a> in the CAPI V3 documentation.
Quotas	Pushing updates to your app using a deployment strategy creates up to <code>max_in_flight</code> new instances (defaults to 1). Additionally, canary deployments use an extra instance when pausing with the canary instance deployed. If you lack sufficient quota, the deployment fails. Administrators might need to increase quotas to accommodate deployments.
Simultaneous apps when interrupting a push	If you push an app before your previous push command for the same app has completed, your first push gets interrupted. Until the last deployment completes, there might be many versions of the app running at the same time. Eventually, the app runs the code from your most recent push.
V3 APIs	During a rolling deploy for an app, requests to the V3 APIs for scaling or updating a process fail with an error message like <code>Cannot scale this process while a deployment is in flight</code> . For more information, see <a href="#">Scale a process</a> or <a href="#">Update a process</a> in the CAPI V3 documentation.
New or stopped applications	When pushing an application for the first time, or if the app is stopped, no deployment strategy is used and all application instances are started immediately.
Evaluating the canary instance	Because the current processes share the same route, the best way to validate that traffic is reaching the canary instance is by looking at the logs. If app revision logging is enabled, the logs for all instances will be tagged with <code>process_id</code> and <code>revision_version</code> values. e.g. <code>APP/REV/4/PROC/WEB/1</code>
	Retrieve the logs by running the cf CLI command <code>cf logs APP_NAME</code> .

## Commands

This section describes the commands for working with rolling app deployments.

### Deploy an app

To deploy an app without incurring downtime:



Review the limitations of this feature before running the command. For more information, see [Limitations](#).

## For cf CLI v7+

Run:

```
cf push APP-NAME --strategy rolling
```

Where `APP-NAME` is the name that you want to give your app.



cf CLI v7 exits when one instance of each process is healthy. It also includes a `--no-wait` flag for users who don't want to wait for the operation to complete. When `cf push` is used with the `--no-wait` flag, the process exits as soon as one instance is healthy.

If the deployment stops and doesn't restart, cancel it and run it again as described in an earlier step. To cancel, see [Cancel a deployment](#).

## For cf CLI v8.8.0+ and CAPI V3.173.0 or later

Run:

```
cf push APP-NAME --strategy STRATEGY --max-in-flight MAX_IN_FLIGHT
```

Where:

- `APP-NAME` is the name that you want to give your app.
- `MAX_IN_FLIGHT` specifies the maximum number of new instances to start up simultaneously until the deployment is complete. This parameter is optional and defaults to 1.
- `STRATEGY` is the strategy you want to use for the deployment. Valid strategies are `rolling` and `canary`.

## For CAPI V3

1. Log in to the cf CLI.

```
cf login
```

2. Create an empty app by running the following `curl` command with `POST /v3/apps`.

Record the app GUID from the output.

```
cf curl /v3/apps \
-X POST \
-H "Content-type: application/json" \
-d '{
  "name": "APP-NAME",
  "relationships": {
    "space": {
      "data": {
        "guid": "SPACE-GUID"
      }
    }
}'
```

```

    }
}'

```

Where:

- **APP-NAME** is the name that you want to give your app.
- **SPACE-GUID** is the space identifier that you want to associate with your app.

3. Create a package with the following `curl` command with `POST /v3/packages`. Record the package GUID from the output.

```

cf curl /v3/packages \
-X POST \
-H "Content-type: application/json" \
-d '{
  "type": "bits",
  "relationships": {
    "app": {
      "data": {
        "guid": "APP-GUID"
      }
    }
  }
}'

```

Where **APP-GUID** is the app GUID that you recorded in an earlier step. This app GUID is a unique identifier for your app.

4. Upload the package bits by running the following `curl` command with `POST /v3/packages/PACKAGE-GUID/upload`.

```

cf curl /v3/packages/PACKAGE-GUID/upload \
-X POST \
-F bits=@"PACKAGED-APP" \

```

Where:

- **PACKAGE-GUID** is the package GUID that you recorded in an earlier step.
- **PACKAGED-APP** is your app packaged in a file such as `.zip`.

5. Create the build by running the following `curl` command with `POST /v3/builds`. Record the droplet GUID from the output.

```

cf curl /v3/builds \
-X POST \
-H "Content-type: application/json" \
-d '{
  "package": {
    "guid": PACKAGE-GUID
  }
}'

```

Where **PACKAGE-GUID** is the package GUID that you recorded in an earlier step.

- Deploy your app by running the following `curl` command with `POST /v3/deployments`. To verify the status of the deployment or take action on the deployment, record the deployment GUID from the output.

```
cf curl /v3/deployments \
-X POST \
-H "Content-type: application/json" \
-d '{
  "droplet": {
    "guid": "DROPLET-GUID"
  },
  "strategy": STRATEGY,
  "options": {
    "max_in_flight": MAX_IN_FLIGHT
  },
  "relationships": {
    "app": {
      "data": {
        "guid": "APP-GUID"
      }
    }
  }
}'
```

Where:

- `DROPLET-GUID` and `APP-GUID` are the GUIDs that you recorded in earlier steps.
- `MAX_IN_FLIGHT` is an integer that specifies the maximum number of new instances to start up simultaneously until the deployment is complete. Optional and defaults to 1.
- `STRATEGY` is the strategy you would like to use for the deployment. Valid strategies are `rolling` and `canary`.

For more information about this command, see [How Deployment Strategies Work](#).

## Cancel a Deployment

To stop the deployment of an app that you pushed:

- For cf CLI v7+, run:

```
cf cancel-deployment APP-NAME
```

Where `APP-NAME` is the name of the app.

- For CAPI V3, run:

```
cf curl /v3/deployments/DEPLOYMENT-GUID/actions/cancel" -X POST
```

Where `DEPLOYMENT-GUID` is the GUID of the deployment that you recorded after following the CAPI procedure in [Deploy an app](#).

This reverts the app to its state from before the deployment started by:

- Scaling up the original web process

- Removing any deployment artifacts
- Resetting the `current_droplet` on the app



The `cancel` command is designed to revert the app to its original state as quickly as possible and does not guarantee zero downtime. It is important to note that changes to environment variables and service bindings are not reverted.

## Continue a Canary Deployment

To finish a canary deployment after the deployment has paused and the canary instance has been validated:

- **For cf CLI v8+, run:**

```
cf continue-deployment APP-NAME
```

Where `APP-NAME` is the name of the app.

- **For CAPI V3, run:**

```
cf curl /v3/deployments/DEPLOYMENT-GUID/actions/continue" -X POST
```

Where `DEPLOYMENT-GUID` is the GUID of the deployment that you recorded after following the CAPI procedure in [Deploy an app](#).

This continues the rolling deployment of the app.

## Restart an app

Restart your app to apply configuration updates that require a restart, such as environment variables or service bindings.

To restart your app without downtime, run the appropriate command as shown here.

- **For cf CLI v7+, run:**

```
cf restart APP-NAME --strategy STRATEGY
```

Where:

- `APP-NAME` is the name of the app.
- `STRATEGY` is the strategy you would like to use for the deployment. Valid strategies are `rolling` and `canary`.

- **For cf CLI v8.8.0+ and CAPI V3.173.0 or later, run:**

```
cf restart APP-NAME --strategy STRATEGY --max-in-flight MAX_IN_FLIGHT
```

Where:

- `APP-NAME` is the name of the app.

- `MAX_IN_FLIGHT` specifies the maximum number of new instances to restart simultaneous until the deployment is complete. Optional and defaults to 1.
- `STRATEGY` is the strategy you would like to use for the deployment. Valid strategies are `rolling` and `canary`.
- For CAPI V3, run:

```
cf curl /v3/deployments \
-X POST \
-H "Content-type: application/json" \
-d '{
  "droplet": {
    "guid": DROPLET-GUID
  },
  "strategy": STRATEGY,
  "options": {
    "max_in_flight": MAX_IN_FLIGHT
  },
  "relationships": {
    "app": {
      "data": {
        "guid": APP-GUID
      }
    }
  }
}'
```

Where:

- `DROPLET-GUID` and `APP-GUID` are the GUIDs that you recorded in earlier steps.
- `MAX_IN_FLIGHT` is an integer that specifies the maximum number of new instances to start up simultaneous until the deployment is complete. Optional and defaults to 1.
- `STRATEGY` is the strategy you would like to use for the deployment. Valid strategies are `rolling` and `canary`.

## View the status of deployments

You can use CAPI to view the status of deployments.

To view the status of a deployment:

1. Log in to the cf CLI:

```
cf login
```

2. Find the GUID of your app by running:

```
cf app APP-NAME --guid
```

Where `APP-NAME` is the name of the app.

3. Find the deployment for that app by running:

```
cf curl GET /v3/deployments?app_guids=APP-GUID&status_values=ACTIVE
```

Where `APP-GUID` is the GUID of the app. Deployments are listed in chronological order, with the latest deployment displayed as the last in the list.

#### 4. Run:

```
cf curl GET /v3/deployments/DEPLOYMENT-GUID
```

Where `DEPLOYMENT-GUID` is the GUID of the deployment.

The `cf curl GET /v3/deployments/DEPLOYMENT-GUID` command returns the following status properties:

- `status.value`: Indicates if the deployment is `ACTIVE` or `FINALIZED`.
- `status.reason`: Provides detail about the deployment status.
- `status.details`: Provides the timestamp for the most recent successful health check. The value of the `status.details` property can be `nil` with no successful health check for the deployment. For example, there might be no successful health check if the deployment was cancelled.

The following table describes the possible values for the `status.value` and `status.reason` properties:

<code>status.value</code>	<code>status.reason</code>	Description
<code>ACTIVE</code>	<code>DEPLOYING</code>	The deployment is deploying.
<code>ACTIVE</code>	<code>PAUSED</code>	The deployment is paused waiting for the user to continue with the deployment. Used only for canary Deployments.
<code>ACTIVE</code>	<code>CANCELLING</code>	The deployment is cancelling.
<code>FINALIZED</code>	<code>DEPLOYED</code>	The deployment is complete.
<code>FINALIZED</code>	<code>CANCELLED</code>	The deployment was cancelled.
<code>FINALIZED</code>	<code>SUPERSEDED</code>	The deployment was stopped and did not finish deploying because another deployment was created for the app.
<code>FINALIZED</code>	<code>DEGENERATE</code>	The deployment was created incorrectly by the system.

## Pushing apps with sidecar processes

You can run additional processes in the same container as your app. These additional processes are called sidecar processes, or sidecars. An example of a sidecar is an Application Performance Monitoring (APM) tool.



The cf CLI v6 commands described in this topic are unsupported, but are supported in cf CLI v7. The latest supported cf CLI release is cf CLI v8. To upgrade to cf CLI v7, see [Upgrading to cf CLI v7](#). To upgrade to cf CLI v8, see [Upgrading to cf CLI v8](#).

## About sidecars

When you provide a sidecar for your app, VMware Tanzu Application Service for VMs (TAS for VMs) packages the required code and configuration needed to run the sidecar and app in the same droplet. It deploys this droplet in a single container on Diego. Both processes within the container undergo health checks independently.

You can push sidecar processes with your app by using one of two methods:

- Using an app manifest. For instructions, see [Push an app with a sidecar Using an app manifest](#).
- With a custom buildpack. For instructions, see [Sidecar buildpacks](#).

For additional information about sidecars, see [Sidecars](#) in the Cloud Foundry API (CAPI) documentation.

For sample apps that use sidecars, see the [capi-sidecar-samples](#) repository on GitHub. These sample apps use an app manifest.

## Use cases

You can use sidecars for processes that depend on each other or must run in the same container.

For example, you can use sidecars for processes that must:

- Communicate over a UNIX socket or through localhost
- Share the same file system
- Be scaled and placed together
- Have fast interprocess communication

## Limitations

Sidecars have these limitations:

- The start and stop order of app processes and their sidecars is undefined.
- App processes and sidecars are codependent. If either fails or exits, the other does also.
- Sidecars are not independently scalable. Sidecars share resources with the main app process and other sidecars within the container.
- Sidecars only support PID-based health checks. HTTP health checks for sidecars are not supported.

## Requirements for Java apps

These sections describe several requirements that are specific to pushing sidecars with Java apps.

### Reserving memory

You must allocate memory to the sidecar. If you do not, the Java buildpack allocates all of the available memory to the app. As a result, the sidecar does not have enough memory and the app fails to start.

To allocate memory to the sidecar, use the `memory` property in the app manifest. For example:

```
sidecars:
- name: SIDECAR-NAME
```

```
process_types: [ 'PROCESS-TYPES' ]
command: START-COMMAND
memory: 256MB
```

Where:

- `SIDECAR-NAME` is a name you give your sidecar.
- `PROCESS-TYPES` is a list of app processes for the sidecar to attach to, such as `web` or `worker`. You can attach multiple sidecars to each process type your app uses.
- `START-COMMAND` is the command used to start the sidecar. For example, `./binary` or `java -jar java-file.jar`.

You must also allocate memory to sidecars that you push with a custom buildpack. For more information, see [Sidecar buildpacks](#).

## Packaging binaries

If your sidecar is a binary file rather than a set of buildable source files, then you must package the binary file with your Java app.

In some cases, the Java buildpack requires you to push a `.jar` file. If this is the case with your app, you must include the sidecar binary in the `.jar` file.

To package the sidecar binary with the `.jar` file, run:

```
zip JAR -u SIDECAR-BINARY
```

Where:

- `JAR` is your `.jar` file.
- `SIDECAR-BINARY` is your sidecar binary.

For more information about packaging assets with your Java app, see [Cloud Foundry documentation](#).

## Push an app with a sidecar using an app manifest

These sections explain how to push an app with a sidecar using an app manifest. For an example that you can try yourself, see [Sidecar tutorial](#).

When pushing a Java app, follow the requirements listed in [Requirements for Java Apps](#).

## Prerequisites

Before you can push an app with a sidecar with an app manifest, you must have:

- An app that is running or ready to be pushed.
- A file that TAS for VMs can run inside the application container as a sidecar process. For example, an executable binary, a Java `.jar` file, or Ruby scripts.

## Procedure

To push an app with a sidecar:

1. Create an app or use an existing app. To create an app:

```
cf create-app APP-NAME
```

Where `APP-NAME` is the name you give your app.

2. Create a manifest file in the root directory of your app, such as `manifest.yml`. Otherwise, use an existing manifest file for your app. For more information, see [Deploying with app manifests](#).
3. Add the following values to your app manifest file under the `applications` key:

```
sidecars:
  - name: SIDECAR-NAME
    process_types: [ 'PROCESS-TYPES' ]
    command: START-COMMAND
```

Where:

- `SIDECAR-NAME` is a name you give your sidecar.
- `PROCESS-TYPES` is a list of app processes for the sidecar to attach to, such as `web` or `worker`. You can attach multiple sidecars to each process type your app uses.
- `START-COMMAND` is the command used to start the sidecar. For example, `./binary` or `java -jar java-file.jar`.

This example manifest file includes multiple sidecars:

```
---
applications:
  - name: my-app
    sidecars:
      - name: authenticator
        process_types: [ 'web', 'worker' ]
        command: bundle exec run-authenticator
      - name: performance monitor
        process_types: [ 'web' ]
        command: bundle exec run-performance-monitor
```

4. To apply the manifest file to your app:

```
cf apply-manifest -f PATH-TO-MANIFEST
```

Where `PATH-TO-MANIFEST` is the path to your manifest file.

5. To push your app:

```
cf push APP-NAME
```

Where `APP-NAME` is the name of your app.

## Sidecar tutorial

You can explore sidecars using the app in the [capi-sidecar-samples](#) repository on GitHub. The following sections describe the app, how to build and push the app, and some ways to observe the app and its

processes after pushing.



In this tutorial, you are pushing the Ruby sample app. You can also follow this tutorial for a Java app using the `sidecar-dependent-java-app` and `push_java_app_with_binary_sidecar.sh` in the samples repository. When pushing a Java app, follow the requirements listed in [Requirements for Java apps](#).

## About the sample app

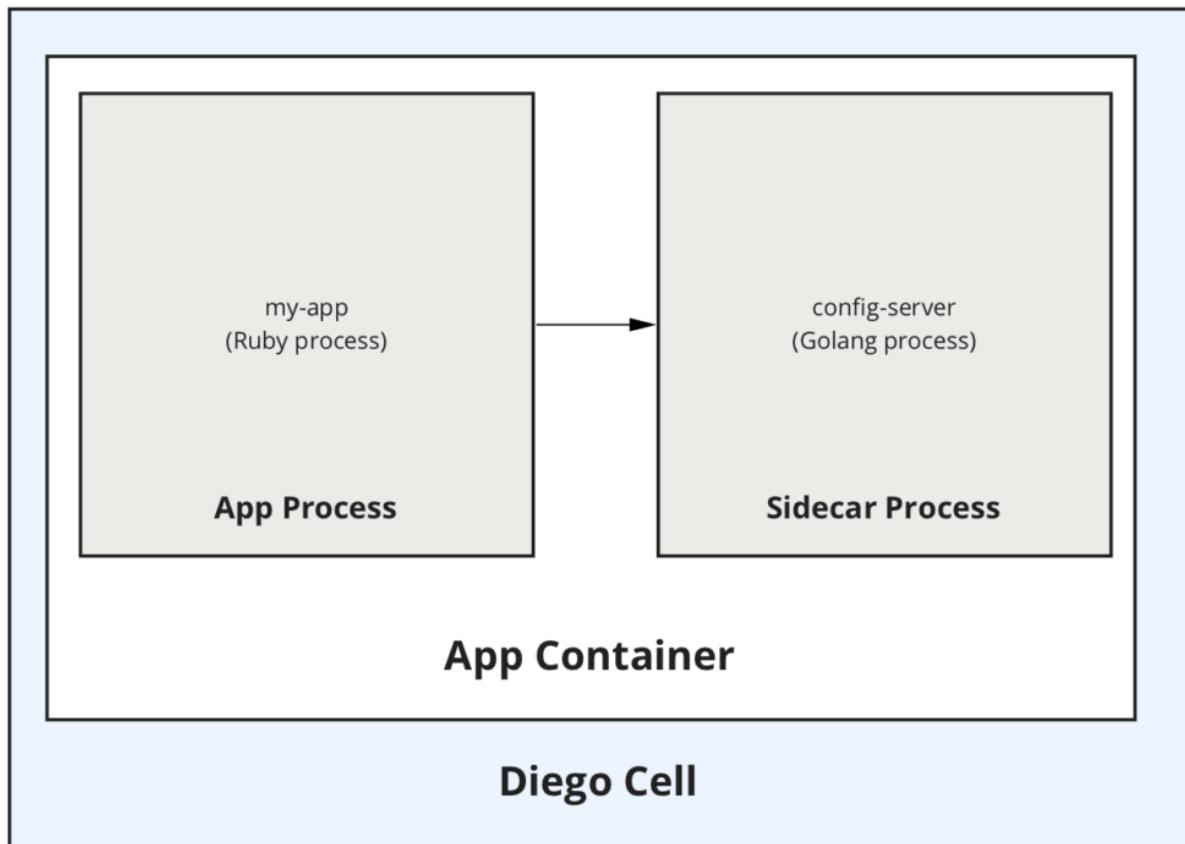
The `capi-sidecar-samples` repository contains:

- **A simple Ruby app:** This app is named `sidecar-dependent-app`. It includes a `/config` endpoint that calls to the sidecar and prints the response, as shown in this code snippet:

```
get '/config' do
  puts "Sending a request to the config-server sidecar at localhost:#{{ENV['CONFIG_SERVER_PORT']}}/config/"
  response = Typhoeus.get("localhost:#{{ENV['CONFIG_SERVER_PORT']}}/config/")
  puts "Received #{response.body} from the config-server sidecar"
  response.body
end
```

- **A Golang sidecar:** The `config-server-sidecar` produces a `config-server` binary. It provides apps with their required configuration over its `/config` endpoint. It also accepts connections only over localhost on the `CONFIG_SERVER_PORT` port. This means the sidecar must be co-located in the same container as the app, so that it shares the same network namespace as the main app.

The following diagram illustrates the app architecture:



## Push the app and sidecar

If you do not have Go installed, download the `config-server_linux_x86-64` binary from [CAPI Sidecar sample releases](#) in the `capi-sidecar-samples` repository in GitHub.

To push the app and sidecar:

1. In a terminal window, clone the Git repository to your workspace by running:

```
git clone https://github.com/cloudfoundry-samples/capi-sidecar-samples.git
```

2. Go to the `config-server-sidecar` directory.
3. Build the binary for the sidecar by running:

```
GOOS=linux GOARCH=amd64 go build -o config-server .
```

4. To create the app:

```
cf create-app sidecar-dependent-app
```

5. Go to the `sidecar-dependent-app` directory.
6. Open and review the `manifest.yml` file. Under `sidecars`, the sidecar is specified with a name, process type, and start command. Under `env`, an environment variable defines the port on which the app and sidecar communicate.

- To apply the manifest to the app:

```
cf apply-manifest
```

- To push the app:

```
cf push sidecar-dependent-app
```

After you push the app, you can further explore it as described in the sections below:

- [View processes running in the app container via SSH](#)
- [View the web URL and app logs via SSH](#)
- [View and debug processes running in the app container via HTTP](#)

## View processes running in the app container via SSH

To view the app and sidecar process running in the container:

- SSH into the application container by running:

```
cf ssh sidecar-dependent-app
```

- To see both the `rackup` process for the main app and `config-server` process for the sidecar, run:

```
ps aux
```

The output you might see resembles this example output:

```
vcap@f00949bd-6601-4731-6f7e-e859:~$ ps aux
USER          PID %CPU %MEM      VSZ      RSS TTY STAT START TIME C
OMMAND
root           1  0.0  0.0     1120       0 ?      S    22:17 0:00 /
tmp/garden-init
vcap           7  0.0  0.0    106716    4508 ?      S    22:17 0:00
./config-server
vcap          13  0.0  0.1    519688   35412 ?      S    22:17 0:00 /
home/vcap/deps/0/vendor_bundle/ruby/2.4.0/bin/rackup config.ru -p 8080
vcap          24  0.0  0.0    116344   10792 ?      S    22:17 0:00 /
tmp/lifecycle/diego-sshd --allowedKeyExchanges= --address=0.0.0.0:2222
--allowUnauthenticatedClients=false --inhe
root          82  0.0  0.0    108012   4548 ?      S    22:17 0:00 /
etc/cf-assets/healthcheck/healthcheck -port=8080 -timeout=1000ms -liven
ess-interval=30s
vcap          215 0.3  0.0     70376    3756 pts/0 S      23:12 0:00 /
bin/bash
vcap          227 0.0  0.0     86268    3116 pts/0 R      23:12 0:00 p
s aux
```

- To see that the sidecar is listening on the port specified by `CONFIG_SERVER_PORT` and that the main `ruby` process is connected to it, run:

```
lsof -i | grep $CONFIG_SERVER_PORT
```

The output you see might resemble this example output:

```
vcap@f00949bd-6601-4731-6f7e-e859:~$ lsof -i | grep $CONFIG_SERVER_PORT
config-se    7 vcap 3u  IPv4 17265901      0t0  TCP *:8082 (LISTEN)
config-se    7 vcap 5u  IPv4 17265992      0t0  TCP localhost:8082->localhost:42266 (ESTABLISHED)
ruby       13 vcap 11u  IPv4 17274965      0t0  TCP localhost:42266->localhost:8082 (ESTABLISHED)
```

## View the web URL and app logs via SSH

To view the web URL and logs for the app:

1. In a browser, go to the `config` endpoint of the `sidecar-dependent-app`. For example:  
`https://sidecar-dependent-app.example.com/config`.
2. See that the browser displays `Scope` and `Password` information. This is the configuration that the app fetches from the `config-server` sidecar.
3. Begin streaming logs for the app by running:

```
cf logs sidecar-dependent-app
```

4. In your browser, refresh the `/config` endpoint page and observe that the log stream in your terminal displays logs for both the sidecar and the main app process.
5. In a separate terminal from your log stream, SSH into the application container by running:

```
cf ssh sidecar-dependent-app
```

6. Stop the sidecar process by running:

```
kill -9 $(pgrep config-server)
```

7. View the output in the terminal where you are streaming the app logs. The app logs indicate that the sidecar process failed and that Diego restarted the application container. For example:

```
2019-04-17T16:48:55.41-0700 [API/0] OUT App instance exited with guid
21df1eb8-f25d-43b2-990b-c1a417310553 payload:
{"instance"=>"a8db0eed-7371-4805-5ad3-4596", "index"=>0,
"cell_id"=>"86808ce7-afc2-47da-9e79-522a62a48cff", "reason"=>"CRASHED",
"exit_description"=>"APP/PROC/WEB/SIDECAR/CONFIG-SERVER: Exited with status 137",
"crash_count"=>1, "crash_timestamp"=>1555544935367052708,
"version"=>"50892dcf-274d-4cf6-b944-3edae000283"}
```

## View and debug processes running in the app container via HTTP

Sidecars can be used to collect debug information (e.g. thread dumps) from another process running in the same container. This is especially useful if you want to debug a running process using an HTTP request, for

instance if you do not have ssh access to the application container.

This is an example of a simple routable debug sidecar for java applications, but the same concept can be adapted to more advanced debug tooling and other languages or frameworks.

## Prerequisites

Before you begin, you must have:

- A java app with a [manifest](#) that is ready to be pushed. For example, the [java sample app](#) from CF Acceptance Tests.
- A route to map to the debug sidecar

## Procedure

To add a debug sidecar to the java app:

1. Create a sidecar that responds to HTTP requests and calls `kill -3` on the java process. When a java process receives the resulting SIGQUIT signal, it will print a thread dump to STDOUT. For an example, see the [java\\_debug\\_sidecar](#) on GitHub.
2. Place the sidecar binary in the root directory of your java app
3. Add the following to your app manifest:

```
sidecars:
- name: debug-sidecar
  process_types: [ 'web' ]
  command: START-COMMAND
  memory: 256MB
```

Where `START-COMMAND` is the command used to start the sidecar. For the above example sidecar, `./java_debug_sidecar`.

4. Push the java application. For example:

```
cf push APP-NAME -f manifest.yml -m 1G
```

Where `APP-NAME` is the name of your app.

5. Map a route to the sidecar process's port. For detailed steps, see [Configuring Cloud Foundry to route traffic to apps on custom ports](#).

```
cf curl -X PATCH /v3/routes/ROUTE-GUID/destinations -d '{
  "destinations": [
    {
      "app": {
        "guid": "APP-GUID",
        "process": {
          "type": "web"
        }
      },
      "port": PORT,
      "protocol": "http1"
    }
  ]
}'
```

```
    ]
}'
```

Where:

- APP-GUID is the GUID of your app.
- ROUTE-GUID is the GUID of the route to map to the sidecar.
- PORT is a custom port on which your app is configured to receive requests. This is 8081 for the above example.

6. Restart the app to complete the port mapping

```
cf restart APP_NAME
```

Where APP-NAME is the name of your app.

7. Tail the app logs:

```
cf logs APP_NAME
```

Where APP-NAME is the name of your app.

8. In another terminal, make a HTTP request to the sidecar, to trigger the thread dump. For example:

```
curl https://debug-sidecar.example.com/threaddump
```

9. Observe the thread dump in the app logs

## Next Steps

Now that you have a simple debugging sidecar working, here are some ideas for next steps:

- Use more sophisticated debugging tools
- Return the debug information in the HTTP response, rather than logging to STDOUT
- Inject the debug sidecar via a [Sidecar buildpacks](#). For example: [java-debug-buildpack](#) on GitHub.
- Add authentication for the debug sidecar's HTTP route, for instance using an authentication [Route Service](#).

## Using blue-green deployment to reduce downtime

Blue-green deployment is a technique that helps you reduce app downtime and risk by running two identical production environments: “Blue” and “Green.”

At any time, only one of the environments is live, with the live environment serving all production traffic.

For the example discussed here, Blue is live and Green is idle. As you prepare a new version of your software, deployment and the final stage of testing takes place in the environment that is not live: in this example, Green. After deploy and fully tested the software in Green, you switch the router so that all incoming requests now go to Green instead of Blue. Green is now live, and Blue is idle.

This technique can eliminate downtime due to app deployment. In addition, blue-green deployment reduces risk: if something unexpected happens with your new version on Green, you can immediately roll back to

the last version by switching back to Blue.

You can adjust the route mapping pattern to display a static maintenance page during a maintenance window for time-consuming tasks such as migrating a database. In this scenario, the router switches all incoming requests from Blue to Maintenance to Green.



If your app uses a relational database, blue-green deployment can lead to discrepancies between your green and glue databases during an update. To maximize data integrity, configure a single database for backward and forward compatibility.

## Blue-green deployment with Cloud Foundry example

For this example, consider a simple app: “demo-time.” This app is a webpage that displays the words “Blue time” and the date/time on the server.

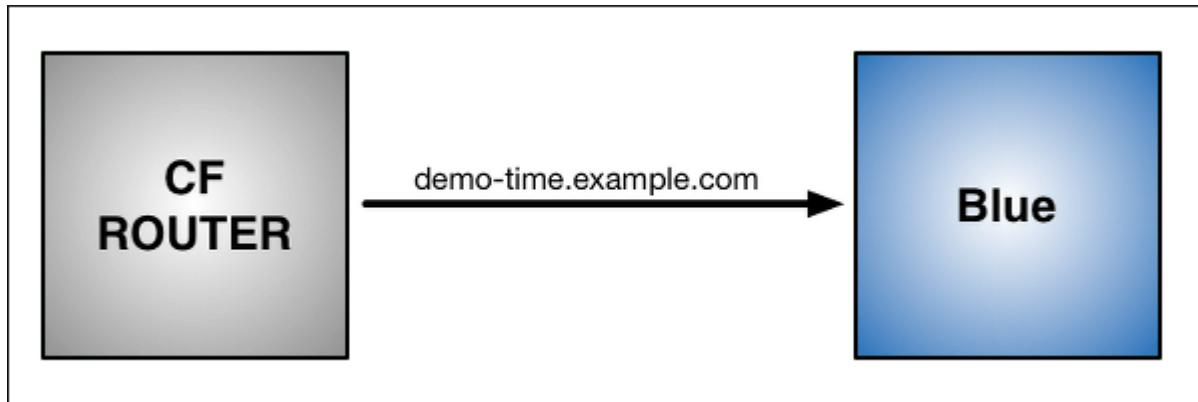
### Step 1: Push an app

Use the Cloud Foundry Command Line Interface (cf CLI) to push the app. Name the app “Blue” with the subdomain “demo-time.”

```
$ cf create-route example.com --hostname demo-time
$ cf push Blue
$ cf map-route Blue example.com --hostname demo-time
```

As shown in the graphic:

- Blue is now running on Cloud Foundry.
- The Cloud Foundry Router sends all traffic for `demo-time.example.com` traffic to Blue.



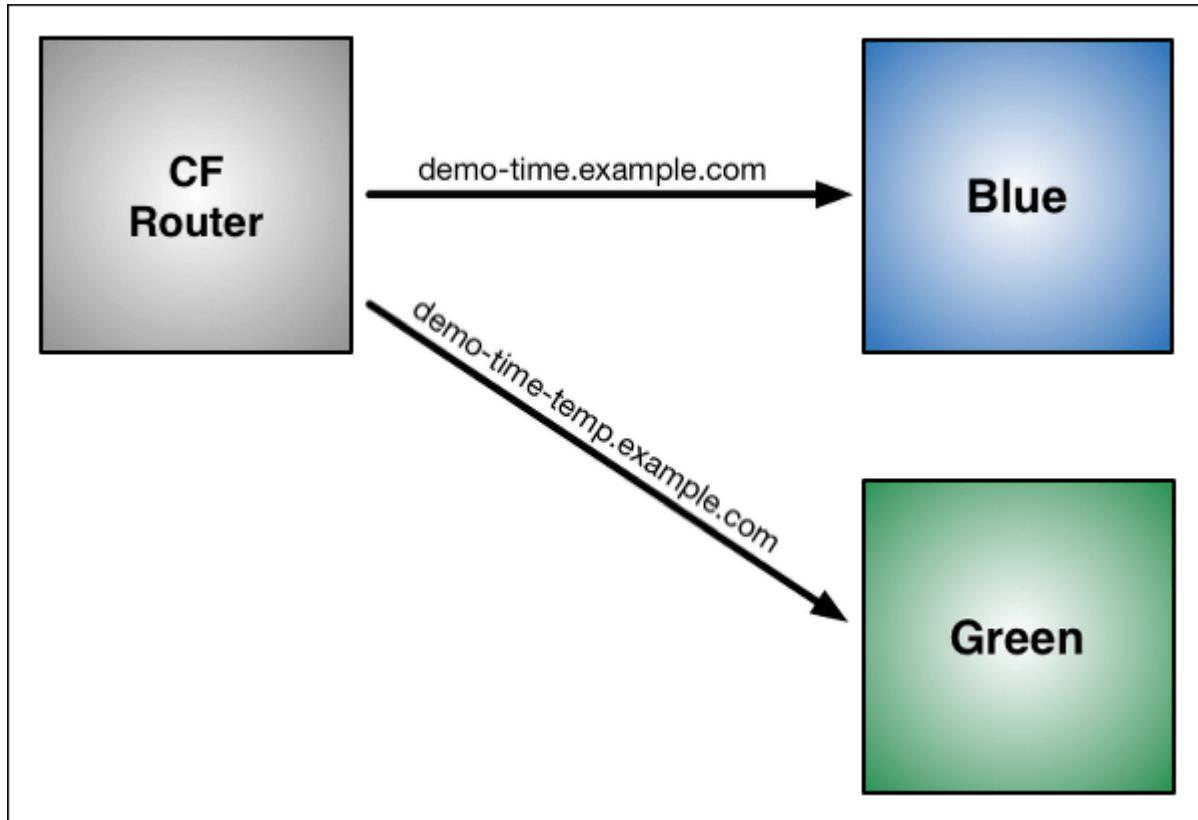
### Step 2: Update app and push

Now make a change to the app. 1. Replace the word “Blue” on the webpage with “Green,” then rebuild the source file for the app. 1. Run `cf push` again, but use the name “Green” for the app and provide a different subdomain to create a temporary route:

```
$ cf create-route example.com --hostname demo-time-temp
$ cf push Green
$ cf map-route Green example.com --hostname demo-time-temp
```

After this push:

- Two instances of the app are now running on Cloud Foundry: the original Blue and the updated Green.
- The Cloud Foundry Router continues sending all traffic for `demo-time.example.com` to Blue. The router now also sends any traffic for `demo-time-temp.example.com` to Green.



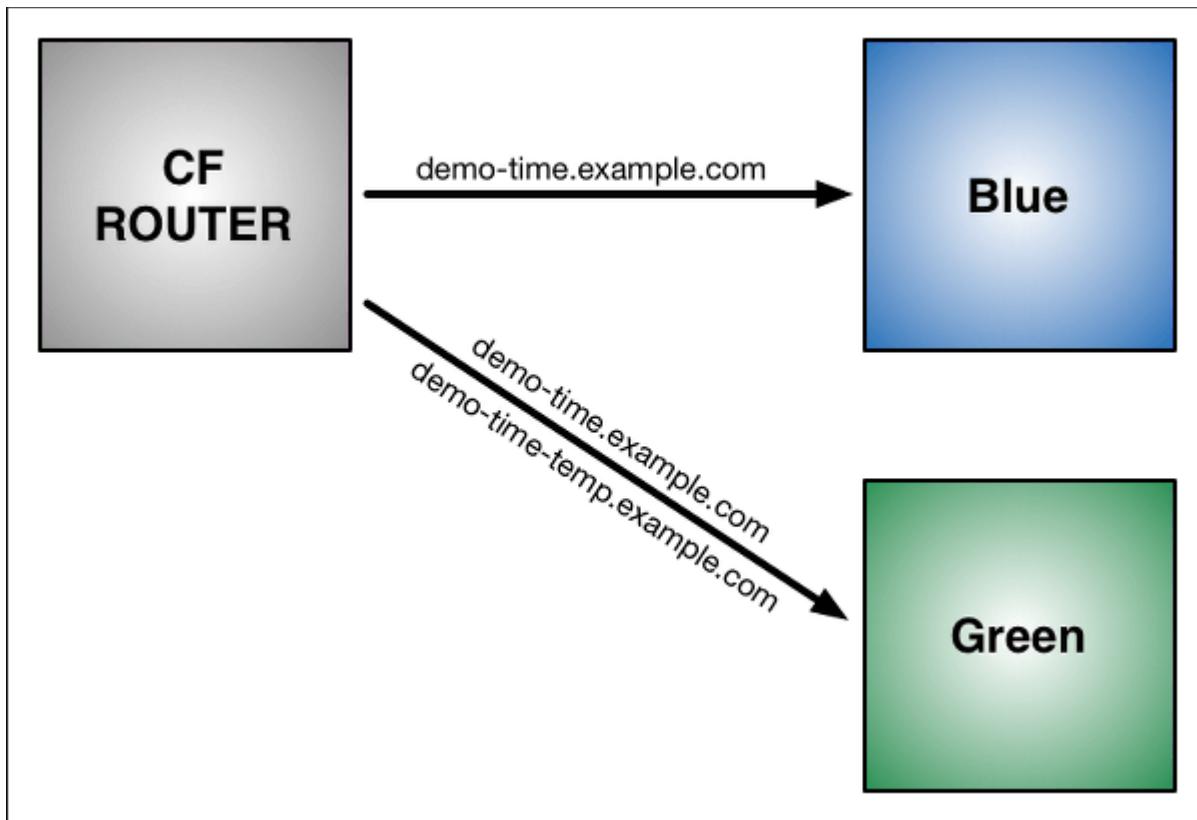
### Step 3: Map original route to Green

Now that both apps are up and running, switch the router so all incoming requests go to the Green app *and* the Blue app. Do this by mapping the original URL route (`demo-time.example.com`) to the Green app using the `cf map-route` command.

```
$ cf map-route Green example.com -n demo-time
Binding demo-time.example.com to Green... OK
```

After the `cf map-route` command :

- The Cloud Foundry Router continues sending traffic for `demo-time-temp.example.com` to Green.
- Within a few seconds, the Cloud Foundry Router begins load balancing traffic for `demo-time.example.com` between Blue and Green.



## Step 4: Unmap route to Blue

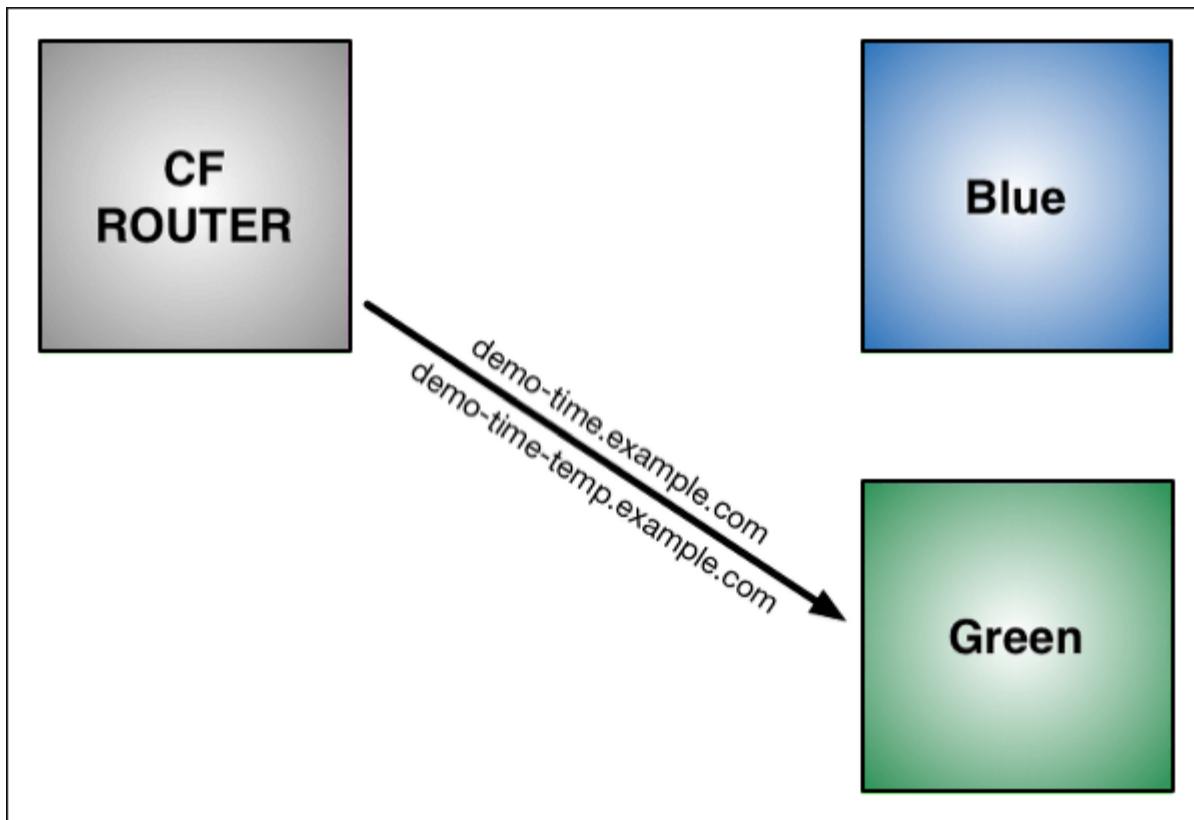
After you verify that Green is running as expected, stop routing requests to Blue using the `cf unmap-route` command:

```
$ cf unmap-route Blue example.com -n demo-time  
Unbinding demo-time.example.com from blue... OK
```

After the `cf unmap-route` command:

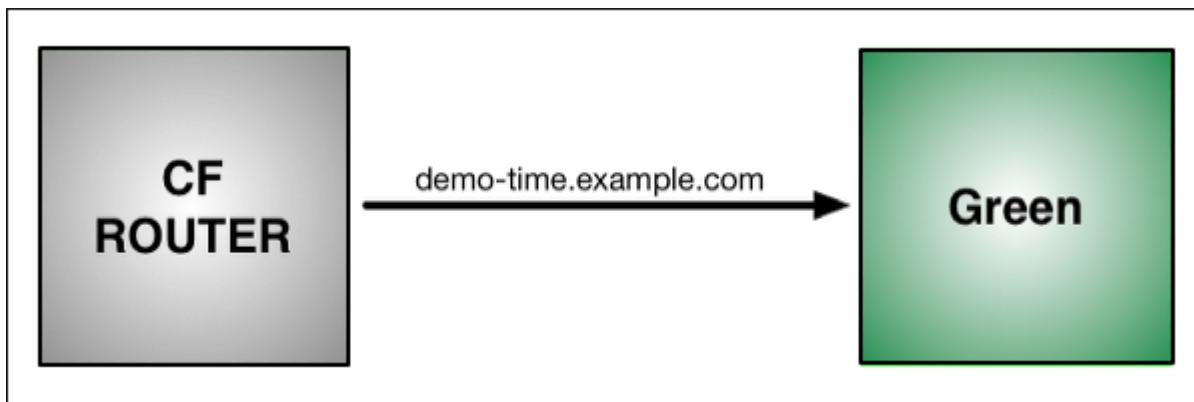
- The Cloud Foundry Router stops sending traffic to Blue.

Now all traffic for `demo-time.example.com` is sent to Green.



## Step 5: Remove temporary route to Green

You can now use `cf unmap-route` to remove the route `demo-time-temp.example.com` from Green. You can delete the route using `cf delete-route` or reserved it for later use. You can also decommission Blue, or keep it in case you need to roll back your changes.



## Implementation

Cloud Foundry community members have written a plug-in to automate blue-green deployment:

- [BlueGreenDeploy](#): `cf-blue-green-deploy` is a plug-in, written in Go, for the Cloud Foundry Command Line Interface (`cf` CLI) that automates a few steps involved in zero-downtime deployments.

## Troubleshooting app deployment and health

You can diagnose and resolve common issues when you deploy and run apps on VMware Tanzu Application Service for VMs (TAS for VMs).

## Common issues

The following sections describe common issues you might encounter when attempting to deploy and run your app, and suggest possible resolutions.

### cf push times out

If your deployment times out during the upload or staging phase, you might receive one of these error messages:

- `504 Gateway Timeout`
- `Error uploading application`
- `Timed out waiting for async job JOB-NAME to finish`

If this happens:

- **Check your network speed.** Depending on the size of your app, your `cf push` can timeout if the upload takes too long. VMware recommends an Internet connection speed of at least 768 KB/s, or 6 Mb/s, for uploads.
- **Make sure you are pushing only needed files.** By default, `cf push` pushes all the contents of the current working directory. Make sure you are pushing only the directory for your app. If your app is too large, or if it has many small files, TAS for VMs might timeout during the upload. To reduce the number of files you are pushing, ensure that you push only the directory for your app, and remove unneeded files or use the `.cfignore` file to specify excluded files. For more information, see [Ignore unnecessary files when pushing](#) in *Considerations for Designing and Running an App in the Cloud*.
- **Set the `CF_STAGING_TIMEOUT` and `CF_STARTUP_TIMEOUT` environment variables.** By default, your app has 15 minutes to stage and 5 minutes to start. You can increase these times by setting `CF_STAGING_TIMEOUT` and `CF_STARTUP_TIMEOUT`. For more information, run `cf push -h`.
- **If your app contains a large number of files, try pushing the app repeatedly.** Each push uploads a few more files. Eventually, all files upload, and the push succeeds. This is less likely to work if your app has many small files.

### App too large

If your app is very large, you might receive an error message on `cf push`. For example:

- `413 Request Entity Too Large`
- `You have exceeded your organization's memory limit`

If this happens:

- **Make sure your org and space have enough resources for all instances of your app.** You cannot use more resources in a space than is allocated for your org. To view the resource quota name for your org, use `cf org ORG-NAME`, then `cf org-quota QUOTA-NAME`. To view resource quota name for your space, use `cf space SPACE-NAME`, then `cf space-quota QUOTA-NAME`. Your

total organization resource usage is the sum of the resources used by all apps in all spaces within the org. Each app's resource usage is the resources allocated to it multiplied by the number of instances. To view the resource usage of all the apps in a space, use `cf apps`, then `cf app APP-NAME` for each app.

- **Make sure your app is less than 1 GB.** By default, `cf push` deploys all the contents of the current working directory. To reduce the number of files you are pushing, ensure that you push only the directory for your app, and remove unneeded files or use the `.cfignore` file to specify excluded files. The following limits apply:
  - The app files to push cannot exceed 1 GB.
  - The droplet that results from compiling those files cannot exceed 1.5 GB. Droplets are typically a third larger than the pushed files.
  - The combined size of the app files, compiled droplet, and buildpack cache cannot total more than 4 GB of space during staging.

## Unable to detect a supported app type

If TAS for VMs cannot identify an appropriate buildpack for your app, you see an `Unable to detect a supported app type` error.

You can view what buildpacks are available with the `cf buildpacks` command.

If you see a buildpack that you believe supports your app, see [Using Classic Buildpacks in Cloud Foundry](#) for details about how that buildpack detects apps it supports.

If you do not see a buildpack for your app, you might still be able to push your app with a [custom buildpack](#) using `cf push -b` with a path to your buildpack.

## App deploy fails

Even when the deployment fails, the app might exist on TAS for VMs. Run `cf apps` to review the apps in the targeted org and space. You might be able to correct the issue using the CLI or [About Apps Manager](#), or you might need to delete the app and re-deploy.

If you push multiple apps using a manifest and one fails to deploy, TAS for VMs does not attempt to push apps specified after the app that failed.

Common reasons deploying an app fails include:

- The app does not bind to a service, such as a PostgreSQL or MongoDB. The service might not exist, be down, or reject the binding.
- The app does not have a unique URL. For more information, see [App requires unique URL](#).

## App requires unique URL

TAS for VMs requires that each app that you deploy has a unique URL. Otherwise, the new app URL collides with an existing app URL and TAS for VMs cannot deploy the app. You can resolve this issue by running `cf push` with either of the following flags to create a unique URL:

- `--random-route` to create a URL that includes the app name and random words. Using this option might create a long URL, depending on the number of words that the app name includes.

## App fails to start

After `cf push` stages the app and uploads the droplet, the app might fail to start, commonly with a pattern of starting and failing similar to the following example:

```
----> Uploading droplet (23M)
...
0 of 1 instances running, 1 starting
0 of 1 instances running, 1 down
...
0 of 1 instances running, 1 failing
FAILED
Start unsuccessful
```

If this happens:

- **Find the reason app is failing and modify your code.** Run `cf events APP-NAME` and `cf logs APP-NAME --recent` and look for messages similar to the following example:

```
2018-07-20T15:53:26.00-0700    app.crash      app-name   index: 2, reason: CRASHED, cell_id: d874ad05-d0ca-4c63-9f5a-0b1ddd90dd5d, instance: f406c53e-b1ca-4a0f-6140-dddd, exit_description: APP/PROC/WEB: Exited with status 1
```

These messages can identify a memory or port issue. If they do, take that as a starting point when you re-examine and fix your app code.

- **Ensure that your app code uses the `PORT` environment variable.** Your app might be failing because it is listening on the wrong port. Instead of hard-coding the port on which your app listens, use the `PORT` environment variable. For example, this Ruby snippet assigns the port value to the `listen_here` variable:

```
listen_here = ENV['PORT']
```

For more examples specific to your app framework, see [Using Classic Buildpacks in Cloud Foundry](#) for your app's language.

- **Ensure that your app adheres to the principles described in [Twelve-Factor App](#) and [Prepare to deploy an app](#).** These texts explain how to prevent situations where your app builds locally but fails to build in the cloud.
- **Verify the timeout configuration of your app.** App health checks use a timeout setting when an app starts up for the first time. For more information, see [Using app health checks](#). If an app fails to start up due to health check timeout, you might see messages in the logs similar to the following example:

2017-01-30T14:07:20.39-0800 [CELL/0]	OUT Creating container
2017-01-30T14:07:20.65-0800 [CELL/0]	OUT Successfully created container
2017-01-30T14:07:22.30-0800 [CELL/0]	OUT Starting health monitoring of container
2017-01-30T14:08:23.52-0800 [CELL/0]	ERR Timed out after 1m0s:

```

health check never passed.
2017-01-30T14:08:23.57-0800 [CELL/0] OUT Destroying container
2017-01-30T14:08:23.59-0800 [API/0] OUT Process has crashed with t
ype: "web"
2017-01-30T14:08:23.59-0800 [CELL/0] OUT Creating container
2017-01-30T14:08:23.60-0800 [API/0] OUT App instance exited with g
uid 91086440-bac0-44f0-808f-a034a1ec2ed0
payload: {"instance":>"", "index":>0, "reason":>"CRASHED",
"exit_description":>"2 error(s) occurred:\n\n* 1 error(s)
occurred:\n\n* Exited with status 6\n* 2 error(s)
occurred:\n\n* cancelled\n* cancelled", "crash_count":>1,
"crash_timestamp":>1485814103565763172,
"version":>"3e6e4232-7e19-4168-9583-1176833d2c71"}
2017-01-30T14:08:23.83-0800 [CELL/0] OUT Successfully destroyed con
tainer
2017-01-30T14:08:23.84-0800 [CELL/0] OUT Successfully created conta
iner
2017-01-30T14:08:25.41-0800 [CELL/0] OUT Starting health monitoring
of container

```

## App consumes too much memory, then fails

An app that `cf push` has uploaded and started can fail later if it uses too much memory.

**Make sure your app is not consuming more memory than allowed.** When you ran `cf push` and `cf scale`, that configured a limit on the amount of memory your app uses. Verify your app's actual memory usage. If it exceeds the limit, edit the app to use less memory.

## Routing conflict

TAS for VMs allows multiple apps, or versions of the same app, to be mapped to the same route. This feature activates blue-green deployment. For more information see [Using blue-green deployment to reduce downtime and risk](#).

Routing multiple apps to the same route might cause undesirable behavior in some situations by routing incoming requests randomly to one of the apps on the shared route.

If you suspect a routing conflict, run `cf routes` to verify the routes in your TAS for VMs deployment.

If two apps share a route outside of a blue-green deployment strategy, choose one app to reassign to a different route and use the following procedure:

1. Remove the existing route from that app by running:

```
cf unmap-route APP-NAME OLD-ROUTE
```

2. Map the app to a new, unique route by running:

```
cf map-route APP-NAME NEW-ROUTE
```

## Gather diagnostic information

This section describes how to gather diagnostic information and troubleshoot app deployment issues.

## Examine environment variables

`cf push` deploys your app to a container on the server. The environment variables in the container govern your app.

You can set environment variables in a manifest created before you deploy. For more information, see [Deploying with app manifests](#).

You can also set an environment variable by running `cf set-env`, followed by `cf push`. You must run `cf push` for the variable to take effect in the container environment.

Run `cf env APP-NAME` to view the environment variables that you have set using the `cf set-env` command and the variables in the container environment:

```
Getting env variables for app example-app in org example-org / space development as admin...
OK
```

System-Provided:

```
{
  "VCAP_SERVICES": {
    "p-mysql-n/a": [
      {
        "credentials": {
          "uri": "postgres://lrra:e6B-X@p-mysqlprovider.example.com:5432/lraa",
          "label": "p-mysql-n/a",
          "name": "p-mysql",
          "syslog_drain_url": "",
          "tags": ["postgres", "postgresql", "relational"]
        }
      }
    ]
  }
}
```

User-Provided:

```
my-env-var: 100
my-drain: http://drain.example.com
```

## View logs

To view app logs streamed in real time, run `cf logs APP-NAME`.

To aggregate your app logs to view log history, bind your app to a syslog drain service. For more information, see [Streaming app logs to log management services](#).



The Diego architecture does not support the `cf files` command, and `cf files` was removed as of cf CLI v7.

## Trace Cloud Controller REST API calls

If a command fails or produces unexpected results, re-run it with HTTP tracing activated to view requests and responses between the Cloud Foundry Command Line Interface (cf CLI) and the Cloud Controller REST API.

For example:

- Re-run `cf push` with `-v`:

```
cf push APP-NAME -v
```

- Re-run `cf push` while appending API request diagnostics to a log file:

```
CF_TRACE=PATH-TO-TRACE.LOG cf push APP-NAME
```

These examples activate HTTP tracing for a single command only. To activate it for an entire shell session, set the variable first:

```
export CF_TRACE=true
export CF_TRACE=PATH-TO-TRACE.LOG
```



`CF_TRACE` is a local environment variable that modifies the behavior of the cf CLI. Do not confuse `CF_TRACE` with the variables in the container environment where your apps run. For more information about these container variables, see [Examine environment variables](#).

## Analyze Zipkin trace IDs

When the Zipkin feature is activated in TAS for VMs, the Gorouter adds or forwards Zipkin trace IDs and span IDs to HTTP headers. For more information about what the Gorouter provides in the HTTP header, see [HTTP headers in HTTP Routing](#).

After adding Zipkin HTTP headers to app logs, developers can run `cf logs APP-NAME` to correlate the trace and span IDs logged by the Gorouter with the trace IDs logged by their app. To correlate trace IDs for a request through multiple apps, each app must forward appropriate values for the headers with requests to other apps.

## Use troubleshooting commands

You can investigate app deployment and health using the cf CLI.

Some of CLI commands return connection credentials. Remove credentials and other sensitive information from command output before you post the output a public forum.

- `cf apps`: Returns a list of the apps deployed to the current space with deployment options, including the name, current state, number of instances, and URLs of each app.
- `cf app APP-NAME`: Returns information about the processes in the current space. Apps are listed alphabetically.



CPU values returned by `cf app` show the total usage of each app instance on all CPU cores on a host VM, where each core contributes 100%. For example, the CPU of a single-threaded app instance on a Diego Cell with one core cannot exceed 100%, and four instances sharing the Diego Cell cannot exceed an average CPU of 25%. A multi-threaded app instance running alone on a Diego Cell with eight cores can draw up to 800% CPU.

- `cf env APP-NAME`: Returns environment variables set using `cf set-env` and variables existing in the container environment.
- `cf events APP-NAME`: Returns information about app failures, including error codes. Shows that an app instance exited. For more detail, look in the app logs. For a list of TAS for VMs errors, see the [cloudfoundry-attic](#) repository on GitHub.
- `cf logs APP-NAME --recent`: Dumps recent logs. For more information, see [Viewing logs in the Command Line Interface in App Logging in TAS for VMs](#).
- `cf logs APP-NAME`: Returns a real-time stream of the app stdout and stderr. Press **Ctrl+C** or **Command+C** on your keyboard to exit the real-time stream.



Your app must direct its logs to stdout and stderr. The `cf logs` command also returns messages from any Log4j facility that you configure to send logs to STDOUT. For more information, see the [Log4j website](#).

## Access apps with SSH

If you need to troubleshoot an instance of an app, you can gain SSH access to the app with the SSH proxy and daemon. For more information, see [App SSH overview](#).

## Send requests to app instance

To obtain debug data without SSH, you can make HTTP requests to a specific instance of an app by using the `X-CF-APP-INSTANCE` HTTP header. For more information, see [App instance routing in HTTP Routing](#).

## Pushing apps to TAS for VMs [Windows]

In this section:

- [Deploying .NET apps](#)
- [Using SMB volumes in .NET apps](#)
- [Developing and pushing .NET Framework apps](#)

## Deploying .NET Apps

This topic provides you with the resources for .NET app developers.

For general information about app deployment, see [Pushing an app](#).

## .NET Framework on Windows

[HWC buildpack](#) describes how to push .NET Framework apps to VMware Tanzu Application Service for VMs [Windows] using the HWC buildpack. It also describes what features of IIS (Internet Information Services) and HWC (Hostable Web Core) are supported, and how to configure your .NET Framework apps to run on TAS for VMs [Windows].

[Console Applications](#) in the *.NET Cookbook* provides information about pushing compiled .NET Framework Console apps to TAS for VMs [Windows] using the binary buildpack.

## .NET Core on Windows

[Binary buildpack](#) describes how to push compiled .NET Core apps to Windows Diego Cells on TAS for VMs [Windows] using the binary buildpack.

## .NET Core on Linux

[.NET Core buildpack](#) describes how to push .NET Core apps to Linux Diego Cells on TAS for VMs using the .NET Core buildpack. For supported ASP.NET Core versions, see the [.NET Core buildpack release notes](#) in the .NET Core buildpack repository on GitHub.

## Other resources

[Tips for .NET Framework developers](#) describes common errors and challenges faced when pushing .NET Framework apps to TAS for VMs [Windows].

The [.Net Cookbook](#) provides code samples, guidelines, tips, and other recipes for making changes to both new and existing .NET Framework and .NET Core apps to run on TAS for VMs [Windows].

## Using SMB Volumes in .NET Apps

You can use Server Message Block (SMB) Volumes in the .NET app. In the example presented here, you create an app that reads and writes to a `note.txt` file within an SMB Volume share.

## Prerequisites

To use SMB Volumes in your .NET App, you must have:

- Visual Studio.
- An IaaS account.
- VMware Tanzu Application Service for VMs [Windows].
- An accessible SMB Volume in an IaaS with a UNC path.
- An existing .NET Framework app.
- An SMB user name.
- An SMB password.

## Using SMB volumes in .NET apps with Steeltoe

Steeltoe is a set of libraries that help your team write cloud-native apps. Steeltoe contains functions for mounting SMB Volumes. You must edit your app code to use Steeltoe.

For more information, see the [Steeltoe documentation](#).

If you are using Steeltoe, add the following environment variables to your Config Server Provider:

- `SMB_PATH` - the UNC path to your SMB
- `SMB_USERNAME` - your IaaS account user name
- `SMB_PASSWORD` - your IaaS account password

For more information about adding environment variables to your Config Server Provider, see [Config Server Provider](#) in the Steeltoe documentation.

After you add your environment variables to your Config Server Provider, go to [SMB mounting](#).

## Using SMB volumes in .NET apps with your batch profile

If you do not want to edit your app code to include Steeltoe, you can use mount SMB volumes without Steeltoe.

To mount SMB Volumes:

1. Retrieve the UNC of your existing SMB share. The UNC is the fully-qualified domain name (FQDN) of your machine.
2. Create a `.profile.bat` file in the root directory of your .NET app.
3. Use Apps Manager or the Cloud Foundry Command Line Interface (cf CLI) to set these environment variables:
  - `SMB_PATH`
  - `SMB_USERNAME`
  - `SMB_PASSWORD`
4. Add this command to your `.profile.bat` file:

```
net use z: %SMB_PATH% %SMB_PASSWORD% /USER:%SMB_USERNAME%
```

Where:

- `SMB_PATH` is the UNC path to your SMB.
- `SMB_USERNAME` is your IaaS account user name.
- `SMB_PASSWORD` is your IaaS account password.

## SMB mounting

To configure SMB mounting:

1. Using the cf CLI or Apps Manager, add `SMB_PATH`, `SMB_USERNAME`, and `SMB_PASSWORD` as environment variables to your local computer or the computer you are using to deploy your app. If Visual Studio does not detect these new environment variables, start Visual Studio again.



If you are using SMB Volumes with your batch profile and have already added these environment variables, ignore this step.

2. In Visual Studio, create a new file in your solution named `SMBConfiguration.cs`. This file is the single representation of your SMB Volume configuration and reads the connection data from the environment variables you established previously. Include the following in your `SMBConfiguration.cs` file:

```
// SMBConfiguration.cs
using System;

namespace NetFrameworkApp.Controllers
{
    public class SMBConfiguration
    {
        public String GetSharePath()
        {
            return Environment.GetEnvironmentVariable("SMB_PATH");
        }

        public String GetUserName()
        {
            return Environment.GetEnvironmentVariable("SMB_USERNAME");
        }

        public String GetPassword()
        {
            return Environment.GetEnvironmentVariable("SMB_PASSWORD");
        }
    }
}
```

3. In Visual studio, create a new MVC Controller named `NoteController`. This file creates a controller endpoint that reads the example note file.

For more information about creating a controller, see the [Microsoft documentation](#).

4. Use your package manager to add `Steeltoe.Common` and `Steeltoe.Common.Net` to your app. If you are not using Steeltoe, ignore this step.
5. Edit `NoteController.cs` to read from a file named `note.txt`. This `note.txt` is created by the  `FileMode.OpenOrCreate` method. See the following example code snippet, which reads the contents of the note file and stashes the `note.txt` content in the Viewbag. If you are not using Steeltoe, ignore the reference to `Steeltoe.Common.Net`.

```
// NoteController.cs
using System;
using System.Collections.Generic;
using System.IO;
using System.Linq;
using System.Net;
using System.Web;
using System.Web.Mvc;
using Steeltoe.Common.Net;
```

```

namespace NetFrameworkApp.Controllers
{
    public class NoteController : Controller
    {
        SMBConfiguration configuration = new SMBConfiguration();
        public ActionResult Index()
        {

            var credential = new NetworkCredential(configuration.GetUserName(),
            configuration.GetPassword());

            using (var share = new WindowsNetworkFileShare(configuration.GetSha
            rePath(), credential))
            using (var inputStream = new FileStream(Path.Combine(configuration.
            GetSharePath(), "note.txt"), FileMode.OpenOrCreate))
            using (var streamReader = new StreamReader(inputStream))
            {
                // Never display raw user input as HTML. Do not do this in producti
                on code.
                ViewBag.Note = streamReader.ReadToEnd();
            }

            return View();
        }
    }
}

```

6. In Visual Studio, create a folder named `Note` in the `Views` folder.
7. In Visual Studio, create a new View named `Index`.

For more information about Views, see [Views in ASP.NET Core MVC](#) and [Add a view to an ASP.NET Core MVC app](#) in the Microsoft documentation.

1. In Visual Studio, create an `Index.cshtml` file that contains:

```

// Index.cshtml

@ViewBag.Note

```

If you run the app now, you see an empty page with no errors.

2. Edit the `Index.cshtml` file to contain a form. This form posts to a yet-to-be-created update endpoint and also displays the note inside a text area.

```

<big>
<xmp>
// Index.cshtml
...
<form action="/note/update" method="post">
    <textarea name="note">@ViewBag.Note</textarea>
    <div>
        <button type="submit">Update</button>
    </div>
</form>
</xmp>
</big>

```

3. Edit the `NoteController.cs` to have an update endpoint. This endpoint saves the data posted to the endpoint back into the `note.txt`. See the example code snippet in this procedure.
4. Edit the `NoteController.cs` to include the ControllerBase class `RedirectToAction` method, which redirects to the index page so the user can see what was just saved. For more information about the ControllerBase class, see the [Microsoft documentation](#).

```
// NoteController.cs
namespace NetFrameworkApp.Controllers
{
    public class NoteController : Controller
    {
        ...
        [HttpPost]
        public ActionResult Update(String note)
        {
            var credential = new NetworkCredential(configuration.GetUserName(),
            configuration.GetPassword());

            using (var share = new WindowsNetworkFileShare(configuration.GetSha
            rePath(), credential))
                using (var outputStream = new FileStream(Path.Combine(configuratio
            n.GetSharePath(), "note.txt"), FileMode.Create))
                    using (var streamWriter = new StreamWriter(outputStream))
                    {
                        streamWriter.Write(note);
                    }

            return RedirectToAction("Index");
        }
    }
}
```

## Known issues

Here is a list of the known issues.

### Inability to SSH into app instance

Even though you created the SMB mapping, you cannot run `cf ssh` into that app instance. Trying to access the created mapping through SSH causes an unspecified path error.

## Tips for .NET Framework developers

You can push .NET Framework apps to VMware Tanzu Application Service for VMs [Windows] Diego Cells.

For information about how to develop microservices for .NET Framework and .NET Core using Steeltoe, see the [Steeltoe documentation](#).

## Prerequisites

- You have installed and configured the TAS for VMs [Windows] tile must be installed and configured. To install TAS for VMs [Windows], see [Installing and configuring TAS for VMs \[Windows\]](#). After you install and configure the TAS for VMs [Windows] tile, developers can push .NET Framework apps to the Windows Diego Cell. Developers can push both [OWIN](#) and non-OWIN apps, and can push apps that are self-hosted or served by Hostable Web Core.
- You have installed the Cloud Foundry Command Line Interface (cf CLI). For information about installing the cf CLI, see [Installing the cf CLI](#).



If you upgrade to TAS for VMs [Windows] and have apps that you want to migrate, see [Upgrading Windows Diego Cells](#).

## Developing .NET Framework apps

### .NET on Operations Manager cookbook

For useful tips and recipes for migrating and developing .NET Framework apps to run on TAS for VMs [Windows], see the [.NET Cookbook](#).

## Pushing a .NET Framework app

By default, Operations Manager serves .NET Framework apps with Hostable Web Core (HWC). HWC is a lighter version of the Internet Information Services (IIS) server that contains the core IIS capability.

To push a .NET Framework app to a Windows Diego Cell:

1. Target the Cloud Controller of your Operations Manager deployment by running:

```
cf api api.APP-DOMAIN
```

Where `APP-DOMAIN` is your app's public domain name. For example, `example.com`.

2. Run one of these commands to deploy your .NET app:

- To deploy an app with `.bat` or `.exe` files, run:

```
cf push -s windows -b binary_buildpack
```

- To deploy a .NET Framework app, run:

```
cf push APP-NAME -s windows -b hwc_buildpack
```

Where `APP-NAME` is the name of your app.

The `-s windows` command instructs Operations Manager to run the app in the Windows Diego Cell. If you are not pushing your app from its directory, use the `-p` command and specify the path to the directory that contains the app.

3. Wait for your app to stage and start. If you see an error message, see [Troubleshoot app errors](#).

## Context path routing support for ASP.NET apps

With context path routing, you can activate multiple apps to share the same route host name. For example, `app1.example.com/app2`. If you use ASP.NET you can host apps under a route path. Within Windows Diego Cells, you can have multiple routes to an app, but those routes cannot have different context paths.

To make an app accessible under another app's URL requires a pair of commands.

To define a context path route, such as `app1.example.com/app2`:

1. Push the top level app by running:

```
cf push TOP-LEVEL-APP-NAME
```

Where `TOP-LEVEL-APP-NAME` is the name of your top-level app.

2. Push the lower-level app by running:

```
cf push LOWER-LEVEL-APP-NAME -d APP-DOMAIN --hostname TOP-LEVEL-APP-NAME --route-path LOWER-LEVEL-APP-NAME
```

Where:

- `TOP-LEVEL-APP-NAME` is the name of your top-level app.
- `LOWER-LEVEL-APP-NAME` is the name of your lower-level app.
- `APP-DOMAIN` is your app's public domain name. For example, `example.com`.



The `-d` parameter is needed only when you push an app to a non-default domain. You can use the `routes` property in the manifest instead.

## Activating a graceful shutdown for a .NET app

Developers can configure .NET apps to shut down gracefully after running the `cf stop` command. When you run the `cf stop` command, the .NET app receives a `CTRL_SHUTDOWN_EVENT` response and is allowed ten seconds to shut down. To activate graceful shutdown, you must include a control handler in the app.

For more information, see [Graceful Shutdown](#) in the .NET Cookbook.

## Pushing a self-hosted app

Developers can choose to push a self-hosted app instead of using Hostable Web Core. Self-hosted apps combine server code with the app code.

To push a self-hosted app:

1. Target the Cloud Controller of your Operations Manager deployment by running:

```
cf api api.APP-DOMAIN
```

Where `APP-DOMAIN` is your app's public domain name. For example, `example.com`.

2. Push your .NET app from the app root by running:

```
cf push APP-NAME -s windows -b binary_buildpack -c PATH-TO-BINARY
```

Where:

- **APP-NAME** is the name of your app.
- **PATH-TO-BINARY** is the path to your executable file.

3. Wait for your app to stage and start. If you see an error message, see [Troubleshoot app errors](#).

## Push a SOAP service

Developers can push Simple Object Access Protocol (SOAP) web services to their Operations Manager deployment by using the procedures in the following sections.

### Step 1: Deploy your web service

To deploy a SOAP web service:

1. Develop the service as an ASMX web service in Microsoft Visual Studio.
2. Publish the service to your local file system.
3. Open a command line shell and go to the directory containing the published web service.
4. Push your service by running:

```
cf push SOAP-SERVICE-NAME -s windows -b hwc_buildpack -p WEB-SERVICE-DIRECTORY
-u none
```

Where:

- **SOAP-SERVICE-NAME** is the name of your service.
- **WEB-SERVICE-DIRECTORY** is the path to the directory containing the published web service.

For example:

```
$ cf push webservice -s windows -b hwc_buildpack -u none

requested state: started
instances: 1/1
usage: 1G x 1 instances
urls: webservice.example.com
```

The push command must include the `-s` flag to specify the stack, which instructs Operations Manager to run the app in the Windows Diego Cell.

The `-p` and `-u` parameters are optional. The `-p` parameter is needed only when you push your service from a directory that does not contain the published web service. The `-u` parameter is needed only when you deactivate the health check when you do not have a route serving `/`.

5. Confirm your service is running by finding your service URL in the push command output and browsing to it. In the previous example, the URL for the service is  
<http://webservice.example.com>.

### Step 2: Edit the WSDL file

Your SOAP web service is now deployed on Operations Manager, but the service WSDL file contains incorrect port information. The WSDL file must be edited to allow an app to consume your web service. Either you or the service developer can perform the needed modification, as shown in this example:

```
- <wsdl:service name="WebService1">
  - <wsdl:port name="WebService1Soap" binding="tns:WebService1Soap">
    <soap:address location="http://webservice.example.com:62492/WebService1.asmx"/>
  </wsdl:port>
  - <wsdl:port name="WebService1Soap12" binding="tns:WebService1Soap12">
    <soap12:address location="http://webservice.example.com:62492/WebService1.asmx"/>
  </wsdl:port>
-</wsdl:service>
```

The WSDL file provides the port number for the SOAP web service as [62492](#). This is the port that the web service listens on in the Garden container, but external apps cannot access the service on this port. Instead, external apps must use port 80, and the Gorouter routes requests to the web service in the container. For more information about the Garden container, see [Container Mechanics](#) in *Container Security*.

For more information about the Gorouter, see [TAS for VMs routing architecture](#).

The URL of the web service in the WSDL file must be modified to remove [62492](#). With no port number, the URL default is port 80. In the previous example, the modified URL is  
<http://webservice.example.com/WebService1.asmx>.

SOAP web service developers can resolve this problem in one of two ways:

- Edit the WSDL file by following the instructions in the [Microsoft documentation](#) from the Microsoft Developers Network.
- Instruct the developers of external apps that consume the web service to follow the procedure in [Consuming SOAP Web Service](#).

## Consuming SOAP Web Service

Developers of external apps that consume the SOAP web service can use a modified version of the WSDL file.

To use a modified version of the WSDL file:

1. In a browser, go to the WSDL file of the web service, using the following URL:

```
https://SOAP-SERVICE-NAME.APP-DOMAIN/ASMX-FILE?wsdl
```

Where:

- [SOAP-SERVICE-NAME](#) is the name of your service.
- [APP-DOMAIN](#) is your site's public domain name.
- [ASMX-FILE](#) is the filename of your asmx file.

For example:

```
https://webservice.example.com/WebService1.asmx?wsdl
```

2. Download the WSDL file to your local machine.
3. Edit the WSDL file to delete the container port, as described in [Edit the WSDL file](#).
4. In Microsoft Visual Studio, right-click your app in the **Solution Explorer** and select **Add > Service Reference**.
5. In **Address**, enter the local path to the modified WSDL file.

For example:

```
C:\Users\example\wsdl.xml
```

6. Click **OK**.

Microsoft Visual Studio generates a client from the WSDL file that you can use in your codebase.

## Context path routing support for SOAP Web Services

Developers can push SOAP web services to their Operations Manager deployment with context path routing.

For more information, see [Context path routing support for ASP.NET apps](#).

## Troubleshooting app errors

If a .NET app does not start, review this list of errors and possible solutions:

- `NoCompatibleCell`: Your Operations Manager deployment cannot connect to your Windows Diego Cell. For more information about troubleshooting your Windows Diego Cell configuration, see [Troubleshooting Windows Diego Cells](#).
- `Start unsuccessful`: Your app might be configured wrong or lacks the required DLL files and dependencies. Verify that:
  - Your app directory contains either a valid `.exe` binary or a valid `Web.config` file.
  - You are pushing from a directory containing your app dependencies. If it does not, specify the app dependency directory with the `-p` flag.

## Getting started deploying Java apps

In this section:

- [Getting started deploying your Grails apps](#)
- [Getting started deploying Ratpack apps](#)
- [Getting started deploying Spring apps](#)

## Getting started deploying Grails apps

This information walks you through deploying a Grails app to Cloud Foundry. If you experience a problem following the steps, refer to the [Known Issues](#) or [Troubleshooting Application Deployment and Health](#) topics for more information.

If you want to go through this tutorial using the sample app, run `git clone https://github.com/cloudfoundry-samples/pong_matcher_grails.git` to clone the `pong_matcher_grails` app from GitHub, and follow the instructions in the Sample app step sections.

Ensure that your Grails app runs locally before continuing with this procedure.

## Deploy a Grails application

This section describes how to deploy a Grails application to Cloud Foundry.

### Prerequisites

- A Grails app that runs locally on your workstation
- Intermediate to advanced Grails knowledge
- The [Cloud Foundry Command Line Interface \(cf CLI\)](#)
- JDK 1.7 or 1.8 for Java 7 or 8 configured on your workstation

You can develop Grails applications in Groovy, Java 7 or 8, or any JVM language. The Cloud Foundry Java buildpack uses JDK 1.8, but you can modify the buildpack and the manifest for your app to compile to JDK 1.7 as described in *Step 8: Configure the Deployment Manifest* of this topic.

### Step 1: (Optional) Declare app dependencies

Declare all the dependency tasks for your app in the build script of your chosen build tool. The table lists build script information for Gradle, Grails, and Maven, and provides documentation links for each build tool.

Build Tool	Build Script	Documentation
Gradle	<code>build.gradle</code>	<a href="#">Gradle User Guide</a>
Grails	<code>BuildConfig.groovy</code>	<a href="#">Grails: Configuration - Reference Documentation</a>
Maven	<code>pom.xml</code>	<a href="#">Apache Maven Project Documentation</a>

You can skip this step. The `pong_matcher_grails/app/grails-app/conf/BuildConfig.groovy` file contains the dependencies for the `pong_matcher_grails` sample app, as shown in the following example.

```
dependencies {
    // specify dependencies here under either 'build', 'compile', 'runtime', 'test' or 'provided' scopes e.g.
    // runtime 'mysql:mysql-connector-java:5.1.29'
    // runtime 'org.postgresql:postgresql:9.3-1101-jdbc41'
    test "org.grails:grails-datastore-test-support:1.0-grails-2.4"
    runtime 'mysql:mysql-connector-java:5.1.33'
}
```

### Step 2: (Optional) Allocate sufficient memory

Run the Cloud Foundry Command Line Interface (cf CLI) `cf push -m` command to specify the amount of memory that should be allocated to the application. Memory allocated this way is done in preset amounts of `64M`, `128M`, `256M`, `512M`, `1G`, or `2G`. For example:

```
$ cf push -m 128M
```

When your app is running, you can use the `cf app APP-NAME` command to see memory utilization.

You can skip this step. In the `manifest.yml` of the `pong_matcher_grails` sample app, the `memory` sub-block of the `applications` block allocates 1 GB to the app.

## Step 3: (Optional) Provide a JDBC driver

The Java buildpack does not bundle a JDBC driver with your application. If your application accesses a SQL RDBMS, you must do the following:

- Include the appropriate driver in your application.
- Create a dependency task for the driver in the build script for your build tool or IDE.

You can skip this step. The `pong_matcher_grails` sample app declares a MySQL JDBC driver in the `pong_matcher_grails/app/grails-app/conf/DataSource.groovy` file because the app uses ClearDB, which is a database-as-service for MySQL-powered apps. The example below shows this declaration.

```
dataSource {
    pooled = true
    jmxExport = true
    driverClassName = "com.mysql.jdbc.Driver"
    dialect = org.hibernate.dialect.MySQL5InnoDBDialect
    uri = new URI(System.env.DATABASE_URL ?: "mysql://foo:bar@localhost")
    username = uri.userInfo ? uri.userInfo.split(":")[0] : ""
    password = uri.userInfo ? uri.userInfo.split(":")[1] : ""
    url = "jdbc:mysql://" + uri.host + uri.path

    properties {
        dbProperties {
            autoReconnect = true
        }
    }
}
```

## Step 4: (Optional) Configure a Procfile

Use a Procfile to declare required runtime processes for your web app and to specify your web server. For more information, see the [Configuring a Production Server](#) topic.

You can skip this step. The `pong_matcher_grails` app does not require a Procfile.

## Step 5: Create and bind a service instance for a Grails application

This section describes using the cf CLI to configure a ClearDB managed service instance for an app. You can use either the CLI or Apps Manager to perform this task. For more information about using Apps Manager, see [About Apps Manager](#).

Cloud Foundry supports two types of service instances:

- Managed services integrate with Cloud Foundry through service brokers that offer services and plans and manage the service calls between Cloud Foundry and a service provider.

- User-provided service instances enable you to connect your application to pre-provisioned external service instances.

For more information about creating and using service instances, refer to the [Services Overview](#) topic.

### Create a service instance

1. View managed and user-provided services and plans available to you by running:

```
cf marketplace
```

The example shows two of the available managed database-as-a-service providers and their offered plans: `cleardb` database-as-a-service for MySQL-powered apps and `postgresql-10-odb` PostgreSQL as a Service.

```
$ cf marketplace
Getting services from marketplace in org Cloud-Apps / space development
as clouduser@example.com...
OK

service          plans           description
on

cleardb         spark, boost, amp   Highly available MySQL for your apps
postgresql-10-odb  standalone, standalone-replica, general PostgreSQL as a Service
```

2. Create a service instance for your app by running:

```
cf create-service SERVICE PLAN SERVICE-INSTANCE
```

Where:

- `SERVICE` and `PLAN` are chosen from the output of the previous step.
- `SERVICE-INSTANCE` is a unique name you provide for the service instance.



Run `cf create-service cleardb spark mysql`. This creates a service instance named `mysql` that uses the `cleardb` service and the `spark` plan, as the example below shows.

```
$ cf create-service cleardb spark mysql
Creating service mysql in org Cloud-Apps / space development as clouduser@example.com....
OK
```

### (Optional) Bind a service instance

When you bind an app to a service instance, Cloud Foundry writes information about the service instance to the `VCAP_SERVICES` app environment variable. The app can use this information to integrate with the service instance.

Most services support bindable service instances. Refer to your service provider's documentation to confirm if they support this functionality.

You can bind a service to an application with the command `cf bind-service APPLICATION SERVICE-INSTANCE`.

Alternately, you can configure the deployment manifest file by adding a `services` sub-block to the `applications` block and specifying the service instance. For more information and an example on service binding using a manifest, see the [Sample App step](#).

You can also bind a service using Apps Manager. For more information about using Apps Manager, see [Adding and Binding services using Apps Manager](#).

You can skip this step because the service instance is already bound. Open the `manifest.yml` file in a text editor to view the bound service instance information. Locate the file in the app root directory and search for the `services` sub-block in the `applications` block, as the example below shows.

```
---
applications:
  ...
    services:
      - mysql
```

## Step 6: (Optional) Configure the deployment manifest file

You can specify deployment options in the `manifest.yml` that the `cf push` command uses when deploying your app.

Refer to the [Deploying with application manifests](#) topic for more information.

You can skip this step. The `manifest.yml` file for the `pong_matcher_grails` sample app does not require any additional configuration to deploy the app.

## Step 7: Log in and target the API endpoint

Enter your log in credentials, and select a space and org.

```
cf login -a API-ENDPOINT
```

Where `API-ENDPOINT` is the URL of the Cloud Controller in your TAS for VMs instance.



You must do this step to run the sample app.

## Step 8: Deploy the application

You must use the cf CLI to deploy apps.

From the root directory of your application, run the following command to deploy your application:

```
cf push APP-NAME -p PATH-TO-FILE.war
```

You must deploy the `.war` artifact for a Grails app, and you must include the path to the `.war` file in the `cf push` command using the `-p` option if you do not declare the path in the `applications` block of the manifest file. For more information, refer to the [Grails](#) section in the Tips for Java Developers topic.

The `cf push` command creates a URL route to your application in the form `HOST.DOMAIN`, where `HOST` is your `APP-NAME` and `DOMAIN` is specified by your administrator. Your `DOMAIN` is `shared-domain.example.com`.

For example, `cf push my-app` creates the URL `my-app.shared-domain.example.com`.

The URL for your app must be unique from other apps that Cloud Foundry hosts or the push will fail. Use the following options to help create a unique URL:

- `-n` to assign a different HOST name for the app
- `--random-route` to create a URL that includes the app name and random words
- `cf help push` to view other options for this command

If you want to view log activity while the app deploys, launch a new terminal window and run `cf logs APP-NAME`.

Once your app deploys, browse to your app URL. Search for the `urls` field in the `App started` block in the output of the `cf push` command. Use the URL to access your app online.



1. Change to the `app` directory, and run `./grails war` to build the app.
2. Run `cf push pong_matcher_grails -n HOST-NAME` to push the app.

Example: `cf push pong_matcher_grails -n my-grails-app`

**This example works for cf CLI v6. The `-n` flag is not supported for cf CLI v7/v8.  
Hostname must be set using the `routes` property in the manifest.**

You do not have to include the `-p` flag when you deploy the sample app. The sample app manifest declares the path to the archive that `cf push` uses to upload the app files.

The following example shows the terminal output of deploying the `pong_matcher_grails` app. `cf push` uses the instructions in the manifest file to create the app, create and bind the route, and upload the app. It then binds the app to the `mysql` service and follows the instructions in the manifest to start two instances of the app, allocating 1 GB of memory between the instances. After the instances start, the output displays their health and status. This example works for cf CLI v6. The `-n` flag is not supported for cf CLI v7/v8. Hostname must be set using the `routes` property in the manifest.

```
$ cf push pong_matcher_grails -n my-grails-app
Using manifest file /Users/example/workspace/pong_matcher_grails/app/manifest.yml
```

```
Creating app pong_matcher_grails in org Cloud-Apps / space development as cloudunder@example.com...
OK
```

```
Creating route my-grails-app.cfapps.io...
OK

Binding my-grails-app.cfapps.io to pong_matcher_grails...
OK

Uploading pong_matcher_grails...
Uploading app files from: /Users/example/workspace/pong_matcher_grails/app/target/pong_matcher_grails-0.1.war
Uploading 4.8M, 704 files
OK
Binding service mysql to app pong_matcher_grails in org Cloud-Apps / space development as clouduser@example.com...
OK

Starting app pong_matcher_grails in org Cloud-Apps / space development as clouduser@example.com...
OK
-----> Downloaded app package (38M)
-----> Java Buildpack Version: v2.5 | https://github.com/cloudfoundry/java-buildpack.git#840500e
-----> Downloading Open Jdk JRE 1.8.0_25 from https://download.run.pivotal.io/openjdk/lucid/x86_64/openjdk-1.8.0_25.tar.gz (1.5s)
        Expanding Open Jdk JRE to .java-buildpack/open_jdk_jre (1.1s)
-----> Downloading Spring Auto Reconfiguration 1.5.0_RELEASE from https://download.run.pivotal.io/auto-reconfiguration/auto-reconfiguration-1.5.0_RELEASE.jar (0.0s)
        Modifying /WEB-INF/web.xml for Auto Reconfiguration
-----> Downloading Tomcat Instance 8.0.14 from https://download.run.pivotal.io/tomcat/tomcat-8.0.14.tar.gz (0.4s)
        Expanding Tomcat to .java-buildpack/tomcat (0.1s)
-----> Downloading Tomcat Lifecycle Support 2.4.0_RELEASE from https://download.run.pivotal.io/tomcat-lifecycle-support/tomcat-lifecycle-support-2.4.0_RELEASE.jar (0.0s)
-----> Downloading Tomcat Logging Support 2.4.0_RELEASE from https://download.run.pivotal.io/tomcat-logging-support/tomcat-logging-support-2.4.0_RELEASE.jar (0.0s)
-----> Downloading Tomcat Access Logging Support 2.4.0_RELEASE from https://download.run.pivotal.io/tomcat-access-logging-support/tomcat-access-logging-support-2.4.0_RELEASE.jar (0.0s)

-----> Uploading droplet (83M)

0 of 2 instances running, 2 starting
0 of 2 instances running, 2 starting
0 of 2 instances running, 2 starting
2 of 2 instances running

App started
```

```
Showing health and status for app pong_matcher_grails in org Cloud-Apps / space development as clouduser@example.com...
OK

requested state: started
instances: 2/2
usage: 1G x 2 instances
urls: my-grails-app.cfapps.io

      state      since            cpu    memory      disk
#0  running   2014-11-10 05:07:33 PM  0.0%  686.4M of 1G  153.6M of 1G
#1  running   2014-11-10 05:07:36 PM  0.0%  677.2M of 1G  153.6M of 1G
```

## Step 9: Test your deployed app

Use the cf CLI or [About Apps Manager](#) to review information and administer your app and your Cloud Foundry account. For example, you can edit the `manifest.yml` to increase the number of app instances from 1 to 3, and redeploy the app with a new app name and host name.

See the [Manage Your Application with the cf CLI](#) section for more information. For more information about using Apps Manager, see [Using Apps Manager](#).

To test the sample app, do the following:

1. To export the test host, run `export HOST=SAMPLE-APP-URL`, substituting the URL for your app for `SAMPLE-APP-URL`.

2. To clear the database from any previous tests, run:

```
curl -v -X DELETE $HOST/all
```

You should get a response of `200`.

3. To request a match as “andrew”, run:

```
curl -v -H "Content-Type: application/json" -X PUT $HOST/match_requests/firstrequest -d '{"player": "andrew"}'
```

You should again get a response of `200`.

4. To request a match as a different player, run:

```
curl -v -H "Content-Type: application/json" -X PUT $HOST/match_requests/secondrequest -d '{"player": "navratilova"}'
```

5. To check the status of the first match request, run:

```
curl -v -X GET $HOST/match_requests/firstrequest
```

The last line of the output shows the `match_id`.

6. Replace `MATCH_ID` with the `match_id` value from the previous step in the following command:

```
curl -v -H "Content-Type: application/json" -X POST $HOST/results -d '
{
  "match_id": "MATCH_ID",
  "winner": "andrew",
```

```
    "loser": "navratilova"
}'
```

You receive a `201 Created` response.

## Manage your application with the cf CLI

Run the `cf help` command to view a complete list of commands, grouped by task categories, and run `cf help COMMAND` for detailed information about a specific command. For more information about using the cf CLI, refer to the Cloud Foundry Command Line Interface (cf CLI) topics.

You cannot perform certain tasks in the CLI or [About Apps Manager](#) because these are commands that only an administrator can run. If you are not an administrator, the following message displays for these types of commands:

```
error code: 10003, message: You are not authorized to perform the requested action
```

For more information about specific Admin commands you can perform with Apps Manager, depending on your user role, see [Getting started with Apps Manager](#).

## Troubleshooting

If your application fails to start, verify that the application starts in your local environment. Refer to the [Troubleshooting Application Deployment and Health](#) topic to learn more about troubleshooting.

### App deploy fails

Even when the deploy fails, the app might exist on Cloud Foundry. Run `cf apps` to review the apps in the currently targeted org and space. You might be able to correct the issue using the CLI or [About Apps Manager](#), or you might have to delete the app and redeploy it.

### App requires a unique URL

Cloud Foundry requires that each app that you deploy have a unique URL. Otherwise, the new app URL collides with an existing app URL and Cloud Foundry cannot successfully deploy the app. You can fix this issue by running `cf push` with the `--random-route` flag to create a unique URL. Using `--random-route` to create a URL that includes the app name and random words might create a long URL, depending on the number of words that the app name includes.

## Getting started deploying Ratpack apps

This information walks you through deploying a Ratpack app to Cloud Foundry. If you experience a problem following the steps, check the [Known Issues](#) topic or refer to the [Troubleshooting Application Deployment and Health](#) topic.

### Sample app step

If you want to go through this tutorial using the sample app, run `git clone https://github.com/cloudfoundry-samples/pong_matcher_groovy.git` to clone the `pong_matcher_groovy` app from GitHub, and follow the instructions in the Sample app step sections.

Ensure that your Ratpack app runs locally before continuing with this procedure.

## Deploy a Ratpack application

This section describes how to deploy a Ratpack application to Cloud Foundry.

### Prerequisites

- A Ratpack app that runs locally on your workstation
- Intermediate to advanced Ratpack knowledge
- The [Cloud Foundry Command Line Interface \(cf CLI\)](#)
- JDK 1.7 or 1.8 for Java 7 or 8 configured on your workstation

You can develop Ratpack applications in Java 7 or 8 or any JVM language. The Cloud Foundry Java buildpack uses JDK 1.8, but you can modify the buildpack and the manifest for your app to compile to JDK 1.7. Refer to Step 8: Configure the Deployment Manifest.

### Step 1: (Optional) Declare app dependencies

Declare all the dependency tasks for your app in the build script of your chosen build tool. The table lists build script information for Gradle and Maven and provides documentation links for each build tool.

Build Tool	Build Script	Documentation
Gradle	<code>build.gradle</code>	<a href="#">Gradle User Guide</a>
Maven	<code>pom.xml</code>	<a href="#">Apache Maven Project Documentation</a>

You can skip this step. The `build.gradle` file contains the dependencies for the `pong_matcher_groovy` sample app, as the example below shows.

```
dependencies {
    // SpringLoaded enables runtime hot reloading.
    // It is not part of the app runtime and is not shipped in the distribution.
    springloaded "org.springframework:springloaded:1.2.0.RELEASE"

    // Default SLF4J binding. Note, this is a blocking implementation.
    // See here for a non blocking appender http://logging.apache.org/log4j/2.x/manual/a
    sync.html
    runtime 'org.slf4j:slf4j-simple:1.7.7'

    compile group: 'redis.clients', name: 'jedis', version: '2.5.2', transitive: true

    testCompile "org.spockframework:spock-core:0.7-groovy-2.0"
}
```

### Step 2: (Optional) Allocate sufficient memory

Use the `cf push -m` command to specify the amount of memory that should be allocated to the application. Memory allocated this way is done in preset amounts of `64M`, `128M`, `256M`, `512M`, `1G`, or `2G`. For example:

```
$ cf push -m 128M
```

When your app is running, you can use the `cf app APP-NAME` command to see memory utilization.

You can skip this step. In the `manifest.yml` of the `pong_matcher_groovy` sample app, the `memory` sub-block of the `applications` block allocates 512 MB to the app.

## Step 3: (Optional) Provide a JDBC driver

The Java buildpack does not bundle a JDBC driver with your application. If your application accesses a SQL RDBMS, you must do the following:

- Include the appropriate driver in your application.
- Create a dependency task for the driver in the build script for your build tool or IDE.

You can skip this step. The `pong_matcher_groovy` sample app does not require a JDBC driver.

## Step 4: (Optional) Configure a Procfile

Use a Procfile to declare required runtime processes for your web app and to specify your web server. For more information, see the [Configuring a Production Server](#) topic.

You can skip this step. The `pong_matcher_groovy` app does not require a Procfile.

## Step 5: Create and bind a service instance for a Ratpack application

Learn how to use the CLI to configure a Redis managed service instance for an app. You can use either the CLI or Apps Manager to perform this task. For more information about using Apps Manager, see [About Apps Manager](#).

Cloud Foundry supports the following types of service instances:

- Managed services integrate with Cloud Foundry through service brokers that offer services and plans and manage the service calls between Cloud Foundry and a service provider.
- User-provided service instances enable you to connect your application to pre-provisioned external service instances.

For more information about creating and using service instances, refer to the [Services Overview](#) topic.

### Creating a service instance

1. View managed and user-provided services and plans available to you by running:

```
cf marketplace
```

The example shows two of the available managed database-as-a-service providers and their offered plans: `postgresql-10-odb` PostgreSQL as a Service and `rediscloud` Enterprise-Class Redis for Developers.

```
$ cf marketplace
Getting services from marketplace in org Cloud-Apps / space development
as clouduser@example.com...
OK
```

service	plans	descripti
---------	-------	-----------

on		
postgresql-10-odb	standalone, standalone-replica, general	PostgreSQL
L as a Service		
rediscloud	30mb, 100mb, 1gb, 10gb, 50gb	Enterprise
e-Class Redis for Developers		

2. Create a service instance for your app by running:

```
cf create-service SERVICE PLAN SERVICE-INSTANCE
```

Where:

- **SERVICE** and **PLAN** are chosen from the output of the previous step.
- **SERVICE-INSTANCE** is a unique name you provide for the service instance.

Run `cf create-service rediscloud 30mb baby-redis`. This creates a service instance named `baby-redis` that uses the `rediscloud` service and the `30mb` plan, as the following example shows.

```
$ cf create-service rediscloud 30mb baby-redis
Creating service baby-redis in org Cloud-Apps / space development as cloduse
r@example.com....
OK
```

#### (Optional) Bind a service instance

When you bind an app to a service instance, Cloud Foundry writes information about the service instance to the `VCAP_SERVICES` app environment variable. The app can use this information to integrate with the service instance.

Most services support bindable service instances. Refer to your service provider's documentation to confirm if they support this functionality.

You can bind a service to an application with the command

```
cf bind-service APPLICATION SERVICE_INSTANCE
```

Alternately, you can configure the deployment manifest file by adding a `services` sub-block to the `applications` block and specifying the service instance. For more information and an example on service binding using a manifest, see the Sample App step.

You can also bind a service using Apps Manager. For more information about using Apps Manager, see [Adding and Binding services using Apps Manager](#).

You can skip this step because the service instance is already bound. Open the `manifest.yml` file in a text editor to view the bound service instance information. Locate the file in the app root directory and search for the `services` sub-block in the `applications` block, as the example below shows.

```
---
applications:
```

```
...
services:
  - baby-redis
```

## Step 6: (Optional) Configure the deployment manifest

You can specify deployment options in the `manifest.yml` that the `cf push` command uses when deploying your app.

See [Deploying with application manifests](#) for more information.

You can skip this step. The `manifest.yml` file for the `pong_matcher_groovy` sample app does not require any additional configuration to deploy the app.

## Step 7: Log in and target the API endpoint

Enter your log in credentials, and select a space and org.

```
cf login -a API-ENDPOINT
```

Where `API-ENDPOINT` is the URL of the Cloud Controller in your TAS for VMs instance.



You must perform this step to run the sample app.

## Step 8: Deploy the app

You must use the `cf` CLI to deploy apps.

From the root directory of your app, run the following command to deploy your application:

```
cf push APP-NAME -p PATH-TO-FILE.distZip
```

You must deploy the `.distZip` artifact for a Ratpack app, and you must include the path to the `.distZip` file in the `cf push` command using the `-p` option if you do not declare the path in the `applications` block of the manifest file. For more information, refer to the [Tips for Java Developers](#) topic.

The `cf push` command creates a URL route to your application in the form `HOST.DOMAIN`, where `HOST` is your `APP-NAME` and `DOMAIN` is specified by your administrator. Your `DOMAIN` is `shared-domain.example.com`.

For example, `cf push my-app` creates the URL `my-app.shared-domain.example.com`.

The URL for your app must be unique from other apps that Cloud Foundry hosts or the push fails. Use the following options to help create a unique URL:

- `-n` to assign a different HOST name for the app
- `--random-route` to create a URL that includes the app name and random words
- `cf help push` to view other options for this command

If you want to view log activity while the app deploys, launch a new terminal window and run `cf logs APP-NAME`.

Once your app deploys, browse to your app URL. Search for the `urls` field in the `App started` block in the output of the `cf push` command. Use the URL to access your app online.

**Sample app step 1.** Change to the `app` directory, and run `./gradlew distZip` to build the app. 1. Run `cf push pong_matcher_groovy -n HOST-NAME` to push the app. Example: `cf push pong_matcher_groovy -n groovy-ratpack-app`

This example is valid for cf CLI v6. In cf CLI v7 and onwards, the `-n` flag is not supported. The host name must be specified in the manifest, using the `routes` attribute.

You do not have to include the `-p` flag when you deploy the sample app. The sample app manifest declares the path to the archive that `cf push` uses to upload the app files.

The following example shows the terminal output of deploying the `pong_matcher_groovy` app. `cf push` uses the instructions in the manifest file to create the app, create and bind the route, and upload the app. It then binds the app to the `baby-redis` service and follows the instructions in the manifest to start one instance of the app with 512 MB. After the app starts, the output displays the health and status of the app. Note, this example is valid for cf CLI v6. In cf CLI v7 and onwards, the `-n` flag is not supported. The host name must be specified in the manifest, using the `routes` attribute.

```
$ cf push pong_matcher_groovy -n groovy-ratpack-app
Using manifest file /Users/example/workspace/pong_matcher_groovy/app/manifest.yml

Creating app pong_matcher_groovy in org Cloud-Apps / space development as clouduser@example.com...
OK

Creating route groovy-ratpack-app.cfapps.io...
OK

Binding groovy-ratpack-app.cfapps.io to pong_matcher_groovy...
OK

Uploading pong_matcher_groovy...
Uploading app files from: /Users/example/workspace/pong_matcher_groovy/app/build/distributions/app.zip
Uploading 138.2K, 18 files
OK
Binding service baby-redis to app pong_matcher_groovy in org Cloud-Apps / space development as clouduser@example.com...
OK

Starting app pong_matcher_groovy in org Cloud-Apps / space development as clouduser@example.com...
OK
----> Downloaded app package (12M)
Cloning into '/tmp/buildpacks/java-buildpack'...
----> Java Buildpack Version: 9e096be | https://github.com/cloudfoundry/java-buildpack#9e096be
      Expanding Open Jdk JRE to .java-buildpack/open_jdk_jre (1.3s)
----> Uploading droplet (49M)
```

```

0 of 1 instances running, 1 starting
1 of 1 instances running

App started

Showing health and status for app pong_matcher_groovy in org Cloud-Apps / spa
ce development as clouduser@example.com...
OK

requested state: started
instances: 1/1
usage: 512M x 1 instances
urls: groovy-ratpack-app.cfapps.io

      state      since            cpu    memory          disk
#0  running   2014-10-28 04:48:58 PM  0.0%  193.5M of 512M  111.7M of 1G

```

## Step 9: Test your deployed app

Use the cf CLI or [About Apps Manager](#) to review information and administer your app and your account. For example, you can edit the `manifest.yml` to increase the number of app instances from 1 to 3, and redeploy the app with a new app name and host name.

See the [Manage Your Application with the cf CLI](#) section for more information. For more information about using Apps Manager, see [Using Apps Manager](#).

To test the sample app, do the following:

1. To export the test host, run `export HOST=SAMPLE-APP-URL`, substituting the URL for your app for `SAMPLE-APP-URL`.

1. To clear the database from any previous tests, run:

```
curl -v -X DELETE $HOST/all
```

You should get a response of `200`.

1. To request a match as “andrew”, run:

```
curl -v -H "Content-Type: application/json" -X PUT $HOST/match_requests/firstrequest -d
'{"player": "andrew"}'
```

You should again get a response of `200`.

1. To request a match as a different player, run:

```
curl -v -H "Content-Type: application/json" -X PUT $HOST/match_requests/secondrequest -d
'{"player": "navratilova"}'
```

1. To check the status of the first match request, run:

```
curl -v -X GET $HOST/match_requests/firstrequest
```

The last line of the output shows the `match_id`.

1. Replace `MATCH_ID` with the `match_id` value from the previous step in the following command:

```
curl -v -H "Content-Type: application/json" -X POST $HOST/results -d '
{
  "match_id": "MATCH_ID",
  "winner": "andrew",
  "loser": "navratilova"
}'
```

You should receive a `201 Created` response.

## Manage your application with the cf CLI

Run `cf help` to view a complete list of commands, grouped by task categories, and run `cf help COMMAND` for detailed information about a specific command. For more information about using the cf CLI, refer to the Cloud Foundry Command Line Interface (cf CLI) topics.

You cannot perform certain tasks in the CLI or [About Apps Manager](#) because these are commands that only an administrator can run. If you are not an administrator, the following message displays for these types of commands:

```
error code: 10003, message: You are not authorized to perform the requested action
```

For more information about specific Admin commands you can perform with Apps Manager, depending on your user role, see [Getting started with Apps Manager](#).

## Troubleshooting

If your application fails to start, verify that the application starts in your local environment. Refer to the [Troubleshooting Application Deployment and Health](#) topic to learn more about troubleshooting.

### App deploy fails

Even when the deploy fails, the app might exist on Cloud Foundry. Run `cf apps` to review the apps in the targeted org and space. You might be able to correct the issue using the CLI or [About Apps Manager](#), or you might have to delete the app and redeploy.

### App requires a unique URL

Cloud Foundry requires that each app that you deploy have a unique URL. Otherwise, the new app URL collides with an existing app URL and Cloud Foundry cannot successfully deploy the app. You can fix this issue by running `cf push` with the `--random-route` flag to create a unique URL. Using `--random-route` to create a URL that includes the app name and random words might create a long URL, depending on the number of words that the app name includes.

## Getting started deploying Spring apps

This guide walks you through deploying a Spring app to Cloud Foundry. You can choose whether to push a sample app, your own app, or both.

If you experience a problem following the steps, see the [Known Issues](#) topic, or refer to the [Troubleshooting Application Deployment and Health](#) topic.

If you want to go through this tutorial using the sample app, run `git clone https://github.com/cloudfoundry-samples/pong_matcher_spring` to clone the `pong_matcher_spring` app from GitHub, and follow the instructions in the Sample app step sections.

Ensure that your Spring app runs locally before continuing with this procedure.

## Deploy a Spring application

This section describes how to deploy your Spring application to Cloud Foundry.

### Prerequisites

- A Spring app that runs locally on your workstation
- Intermediate to advanced Spring knowledge
- The [Cloud Foundry Command Line Interface \(cf CLI\)](#)
- JDK 1.6, 1.7, or 1.8 for Java 6, 7, or 8 configured on your workstation

The Cloud Foundry Java buildpack uses JDK 1.8, but you can modify the buildpack and the manifest for your app to compile to an earlier version. For more information, see [Creating custom buildpacks](#).

### Step 1: (Optional) Declare app dependencies

Make sure to declare all the dependency tasks for your app in the build script of your chosen build tool.

The [Spring Getting Started Guides](#) demonstrate features and functionality you can add to your app, such as consuming RESTful services or integrating data. These guides contain Gradle and Maven build script examples with dependencies. You can copy the code for the dependencies into your build script.

The following table lists build script information for Gradle and Maven and provides documentation links for each build tool.

Build Tool	Build Script	Documentation
Gradle	<code>build.gradle</code>	<a href="#">Gradle User Guide</a>
Maven	<code>pom.xml</code>	<a href="#">Apache Maven Project Documentation</a>

You can skip this step. The `pom.xml` file contains the dependencies for the `pong_matcher_spring` sample app, as the following example shows.

```
<dependencies>
    <dependency>
        <groupId>mysql</groupId>
        <artifactId>mysql-connector-java</artifactId>
    </dependency>
    <dependency>
        <groupId>org.flywaydb</groupId>
        <artifactId>flyway-core</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
```

```

<artifactId>spring-boot-starter-data-jpa</artifactId>
</dependency>
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-test</artifactId>
</dependency>
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-web</artifactId>
</dependency>

<dependency>
    <groupId>com.h2database</groupId>
    <artifactId>h2</artifactId>
    <scope>test</scope>
</dependency>
<dependency>
    <groupId>com.jayway.jsonpath</groupId>
    <artifactId>json-path</artifactId>
    <scope>test</scope>
</dependency>
</dependencies>

```

Make sure you are not building [fully executable jars](#) because application push might fail.

## Step 2: (Optional) Allocate sufficient memory

Use the `cf push -m` command to specify the amount of memory that should be allocated to the application. Memory allocated this way is done in preset amounts of [64M](#), [128M](#), [256M](#), [512M](#), [1G](#), or [2G](#). For example:

```
$ cf push -m 128M
```

When your app is running, you can use the `cf app APP-NAME` command to see memory utilization.

You can skip this step. The Cloud Foundry Java buildpack uses settings declared in the sample app to allocate 1 GB of memory to the app.

## Step 3: Provide a JDBC driver

The Java buildpack does not bundle a JDBC driver with your application. If your application accesses a SQL RDBMS, you must do the following:

- Include the appropriate driver in your application.
- Create a dependency task for the driver in the build script for your build tool or IDE.

You can skip this step. In the `pong_matcher_spring` sample app, the `src/main/resources/application.yml` file declares the JDBC driver, and the `pom.xml` file includes the JDBC driver as a dependency.

## Step 4: (Optional) Configure service connections for a Spring app

Cloud Foundry provides extensive support for creating and binding a Spring application to services such as MySQL, PostgreSQL, MongoDB, Redis, and RabbitMQ. For more information about creating and binding a service connection for your app, refer to [Configuring Service Connections](#).



Run `cf create-service cleardb spark mysql`. This creates a service instance named `mysql` that uses the `cleardb` service and the `spark` plan, as this example shows.

```
$ cf create-service cleardb spark mysql
Creating service mysql in org Cloud-Apps / space development as
a.user@example.com....
OK
```

You can skip this step because the service instance is already bound. Open the `manifest.yml` file in a text editor to view the bound service instance information. Locate the file in the app root directory and search for the `services` sub-block in the `applications` block, as the example below shows.

```
---
applications:
...
services:
- mysql
```

## Step 5: Configure the deployment manifest

You can specify deployment options in a manifest file `manifest.yml` that the `cf push` command uses when deploying your app.

Refer to the [Deploying with Application Manifests](#) topic for more information.

You can skip this step. The `manifest.yml` file for the `pong_matcher_spring` sample app does not require any additional configuration to deploy the app.

## Step 6: Log in and target the API endpoint

Enter your log in credentials, and select a space and org.

```
cf login -a API-ENDPOINT
```

Where `API-ENDPOINT` is the URL of the Cloud Controller in your TAS for VMs instance.

You must do this step to run the sample app.

## Step 7: Deploy your app

You must use the `cf` CLI to deploy apps.

From the root directory of your app, run the following command to deploy your application.

```
cf push APP-NAME -p PATH-TO-FILE.jar
```

Most Spring apps include an artifact, such as a `.jar`, `.war`, or `.zip` file. You must include the path to this file in the `cf push` command using the `-p` option if you do not declare the path in the `applications` block of the manifest file. The example shows how to specify a path to the `.jar` file for a Spring app. Refer to the [Tips for Java Developers](#) topic for CLI examples for specific build tools, frameworks, and languages that create an app with an artifact.

The `cf push` command creates a URL route to your application in the form `HOST.DOMAIN`, where `HOST` is your `APP-NAME` and `DOMAIN` is specified by your administrator. Your `DOMAIN` is `shared-domain.example.com`.

For example, `cf push my-app` creates the URL `my-app.shared-domain.example.com`.

The URL for your app must be unique from other apps that Cloud Foundry hosts or the push fails. Use the following options to help create a unique URL:

- `-n` to assign a different HOST name for the app
- `--random-route` to create a URL that includes the app name and random words
- `cf help push` to view other options for this command

If you want to view log activity while the app deploys, launch a new terminal window and run `cf logs APP-NAME`.

Once your app deploys, go to your app URL. Search for the `urls` field in the `App started` block in the output of the `cf push` command. Use the URL to access your app online.

### Sample app step

1. Run `brew install maven`.
2. Change to the `app` directory, and run `mvn package` to build the app.
3. Run `cf push pong_matcher_spring -n HOSTNAME` to push the app. Example: `cf push pong_matcher_spring -n my-spring-app`.

This example works for cf CLI v6. The `-n` flag is not supported for cf CLI v7/v8. Hostname must be set using the `routes` property in the manifest. You do not have to include the `-p` flag when you deploy the sample app. The sample app manifest declares the path to the archive that `cf push` uses to upload the app files.

The following example shows the terminal output of deploying the `pong_matcher_spring` app. `cf push` uses the instructions in the manifest file to create the app, create and bind the route, and upload the app. It then binds the app to the `mysql` service and starts one instance of the app with 1 GB of memory. After the app starts, the output displays the health and status of the app. This example works for cf CLI v6. The `-n` flag is not supported for cf CLI v7/v8. Hostname must be set using the `routes` property in the manifest.

```
$ cf push pong_matcher_spring -n spring1119
Using manifest file /Users/example/workspace/pong_matcher_spring/manifest.yml

Creating app pong_matcher_spring in org Cloud-Apps / space development as a user@example.com...
OK

Creating route spring1119.cfapps.io...
OK

Binding spring1119.cfapps.io to pong_matcher_spring...
OK
```

```

Uploading pong_matcher_spring...
Uploading app files from: /Users/example/workspace/pong_matcher_spring/target/pong-matcher-spring-1.0.0.BUILD-SNAPSHOT.jar
Uploading 797.5K, 116 files
OK
Binding service mysql to app pong_matcher_spring in org Cloud-Apps / space development as a.user@example.com...
OK

Starting app pong_matcher_spring in org Cloud-Apps / space development as a.user@example.com...
OK
-----> Downloaded app package (25M)
-----> Downloading Open Jdk JRE 1.8.0_25 from https://download.run.pivotal.io/openjdk/lucid/x86_64/openjdk-1.8.0_25.tar.gz (1.2s)
      Expanding Open Jdk JRE to .java-buildpack/open_jdk_jre (1.1s)
-----> Downloading Spring Auto Reconfiguration 1.5.0_RELEASE from https://download.run.pivotal.io/auto-reconfiguration/auto-reconfiguration-1.5.0_RELEASE.jar (0.1s)

-----> Uploading droplet (63M)

0 of 1 instances running, 1 starting
1 of 1 instances running

App started

Showing health and status for app pong_matcher_spring in org Cloud-Apps / space development as a.user@example.com...
OK

requested state: started
instances: 1/1
usage: 1G x 1 instances
urls: spring1119.cfapps.io

      state      since            cpu      memory      disk
#0  running  2014-11-19 12:29:27 PM  0.0%  553.6M of 1G  127.4M of 1G

```

## Step 8: Test your deployed app

Use the cf CLI or [About Apps Manager](#) to review information and administer your app and your Cloud Foundry account. For example, you can edit the `manifest.yml` to increase the number of app instances from 1 to 3, and redeploy the app with a new app name and host name.

See [Manage your application with the cf CLI](#) for more information. For more information about using Apps Manager, see [Using Apps Manager](#).

Sample app step: To test the sample app, do the following:

1. To export the test host, run `export HOST=SAMPLE-APP-URL`, substituting the URL for your app for

SAMPLE-APP-URL.

1. To clear the database from any previous tests, run:

```
curl -v -X DELETE $HOST/all
```

You should get a response of [code:200](#).

1. To request a match as “andrew”, run:

```
curl -v -H "Content-Type: application/json" -X PUT $HOST/match_requests/firstrequest -d '{"player": "andrew"}'
```

You should again get a response of [200](#).

1. To request a match as a different player, run:

```
curl -v -H "Content-Type: application/json" -X PUT $HOST/match_requests/secondrequest -d '{"player": "navratilova"}'
```

1. To check the status of the first match request, run:

```
curl -v -X GET $HOST/match_requests/firstrequest
```

The last line of the output shows the [match\\_id](#).

1. Replace [MATCH\\_ID](#) with the [match\\_id](#) value from the previous step in the following command:

```
curl -v -H "Content-Type: application/json" -X POST $HOST/results -d '
{
  "match_id": "MATCH_ID",
  "winner": "andrew",
  "loser": "navratilova"
}'
```

You should receive a [201 Created](#) response.

## Manage your app with the cf CLI

Run [cf help](#) to view a complete list of commands, grouped by task categories, and run [cf help COMMAND](#) for detailed information about a specific command. For more information about using the cf CLI, refer to the Cloud Foundry Command Line Interface (cf CLI) topics.

You cannot perform certain tasks in the CLI or [About Apps Manager](#) because these are commands that only an administrator can run. If you are not an administrator, the following message displays for these types of commands:

```
error code: 10003, message: You are not authorized to perform the requested action
```

For more information about specific Admin commands you can perform with Apps Manager, depending on your user role, see [Getting started with Apps Manager](#).

## Troubleshooting

If your application fails to start, verify that the application starts in your local environment. Refer to the Troubleshooting Application Deployment and Health topic to learn more about troubleshooting.

## App deploy fails

Even when the deploy fails, the app might exist on Cloud Foundry. Run the `cf apps` command to review the apps in the targeted org and space. You might be able to correct the issue using the CLI or [About Apps Manager](#), or you might have to delete the app and redeploy it.

## App requires a Content-Type

If you specify a `Content-Encoding` header of `gzip` but do not specify a `Content-Type` within your application, Cloud Foundry might send a `Content-Type` of `application/x-gzip` to the browser. This scenario might cause the deploy to fail if it conflicts with the actual encoded content of your app. To avoid this issue, be sure to explicitly set `Content-Type` within your app.

## App requires a unique URL

Cloud Foundry requires that each app that you deploy have a unique URL. Otherwise, the new app URL collides with an existing app URL and Cloud Foundry cannot successfully deploy the app. You can fix this issue by running `cf push` with the `--random-route` flag to create a unique URL. Using `--random-route` to create a URL that includes the app name and random words might create a long URL, depending on the number of words that the app name includes.

# Managing apps

In this section:

- **[Using Apps Manager](#)**
  - [Learning about Apps Manager](#)
  - [Getting started with Apps Manager](#)
  - [Logging in to Apps Manager](#)
  - [Managing orgs and spaces using Apps Manager](#)
  - [Managing your user roles with Apps Manager](#)
  - [Adding and binding services using Apps Manager](#)
  - [Managing your apps and service instances using Apps Manager](#)
  - [Viewing ASGs in Apps Manager](#)
  - [Configuring your Spring Boot Actuator endpoints for Apps Manager](#)
  - [Using Spring Boot Actuators with Apps Manager](#)
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- **[Scaling an app using App Autoscaler](#)**
  - [About App Autoscaler](#)
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  - [Using CPU Entitlement Utilization as a scaling metric](#)
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  - [Using App Autoscaler in production](#)
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- **Using the cf CLI**
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## Using Apps Manager

In this section:

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- Getting started with Apps Manager
- Logging in to Apps Manager
- Managing orgs and spaces using Apps Manager
- Managing your user roles with Apps Manager
- Adding and binding services using Apps Manager
- Managing your apps and service instances using Apps Manager
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  - Tutorial: Scaling a Spring app using a custom scaling metric
  - Scheduled limit changes

- [Using App Autoscaler in production](#)
- [Operating App Autoscaler](#)
- [Using debug logs for App Autoscaler](#)
- [Troubleshooting App Autoscaler](#)

## Learning about Apps Manager

The web-based Apps Manager application helps you manage users, organizations, spaces, and applications in VMware Tanzu Application Service for VMs (TAS for VMs).

Apps Manager provides a visual interface for performing the following subset of functions available through the Cloud Foundry Command Line Interface (cf CLI):

- **Orgs:** Create and manage orgs.
- **Spaces:** Create, manage, and delete spaces.
- **Apps:** Scale apps, bind apps to services, manage environment variables and routes, view logs and usage information, start and stop apps, and delete apps.
- **Services:** Bind services to apps, unbind services from apps, choose and edit service plans, and rename and delete service instances.
- **Users:** Invite new users, manage user roles, and delete users.

To access Apps Manager as the admin user, see [Logging in to Apps Manager](#).

## Getting Started with Apps Manager

Apps Manager is a web-based tool for managing VMware Tanzu Application Service for VMs (TAS for VMs) organizations, spaces, apps, services, and users. This topic helps you get started with Apps Manager.

### Browser support

Apps Manager is compatible with the latest major versions of the following browsers:

- [Apple Safari](#)
- [Google Chrome](#)
- [Microsoft Edge](#)
- [Microsoft Internet Explorer](#)
- [Mozilla Firefox](#)

VMware recommends using Chrome, Firefox, Edge, or Safari for the best Apps Manager experience.

### About permissions

Your ability to perform actions in Apps Manager depends on your user role and the feature flags that the admin sets. For more information about feature flags, see [Using Feature Flags](#).

The following table shows the relationship between specific org and space management actions and the non-admin user roles who can perform them. A non-admin user must be a member of the org and space to perform these actions.

Admin users can perform all of these actions using either the cf CLI or by logging into Apps Manager as an Org Manager, using the UAA Admin credentials.

Space Managers assign and remove users from spaces by setting and unsetting their roles within the space.

Action	CLI command	Org Manager	Space Manager	Org Auditor, Space Developer, or Space Auditor
Create an org	<code>create-org</code>	†	†	†
Delete an org	<code>delete-org</code>	No	No	No
Rename an org	<code>rename-org</code>	Yes	No	No
View org members	<code>org-users</code>	Yes	Yes	Yes
Assign user a role in org	<code>set-org-role</code>	‡	‡	No
Remove org role from user	<code>unset-org-role</code>	‡	‡	No
View space members	<code>space-users</code>	Yes	Yes	Yes
Assign user a role in space	<code>set-space-role</code>	‡	‡	No
Remove space role from user	<code>unset-space-role</code>	‡	‡	No

†Defaults to no. Yes if feature flag `user_org_creation` is set to `true`.

‡Defaults to no. Yes if feature flags `set_roles_by_username` and `unset_roles_by_username` are set to `true`.

## Logging in to Apps Manager

To log in to Apps Manager as the Admin user, do the following steps:

1. If you do not know the system domain for the deployment, select the **Domains** pane in the VMware Tanzu Application Service for VMs (TAS for VMs) tile and see the value configured in the **System domain** field.
2. Open a browser and go to `apps.SYSTEM-DOMAIN`, where `SYSTEM-DOMAIN` is the system domain you retrieved in the previous step. For example, if the system domain is `system.example.com`, then point your browser to `apps.system.example.com`.
3. Log in using UAA credentials for the Admin user.

To obtain these credentials:

1. In the TAS for VMs tile, select the **Credentials** tab.

2. In **UAA**, go to **Admin Credentials**.
3. Click **Link to Credential** in the row showing the credentials you want to see.

<b>UAA</b>	<b>VM Credentials</b>	<b>Link to Credential</b>
	<b>Admin Credentials</b>	<b>Link to Credential</b>

## Managing your orgs and spaces using Apps Manager

You can view and manage orgs and spaces in Apps Manager. This includes creating and deleting orgs, domains, and spaces, managing member permissions, adding metadata, and more in a VMware Tanzu Application Service for VMs (TAS for VMs) environment. To manage a space, you must have Space Manager permissions in that space.

For information about managing apps and service instances, see [Managing apps and service instances using Apps Manager](#).

For more information, see [Configuring Multi-foundation support in Apps Manager](#).

## Prerequisite

You must first log in to Apps Manager with an account that has adequate permissions.

For more information, see [About permissions](#) in *Getting Started with Apps Manager*.

## Manage an org

You can manage org resources, including the spaces, domains, and members associated with the selected space, in Apps Manager. You can also manage org settings.

You can manage an org by navigating to the org in Apps Manager.

To go to an org:

- On the Apps Manager home page, under **Orgs**, click the name of the org that you want to manage.
- Search for the org by entering its name in the search bar.

By default, the landing page for an org in Apps Manager is the org **Spaces** page. You can use the panel on the left side of the screen to go to other pages for resources in the org, such as domains and members.

This image shows an example of the landing page for an org in Apps Manager.

Name	Apps	App Status	Services	Org Quota Usage
my-space	3	● 2 ■ 1 ▼ 0	1	0% (576 MB / 500 GB)
my-space-2	2	● 1 ■ 0 ▼ 1	1	0% (256 MB / 500 GB)

You can manage the resources in an org using Apps Manager.

## Manage spaces

In the org **Spaces** tab, you can:

- See the information for each space:
  - Name
  - Number of apps
  - Number of apps in running, stopped, and crashed states
  - Number of services
  - Memory quota use
- Create a new space.

## Manage domains with Apps Manager

In the org **Domains** page, you can:

- See each **Domain** in your org.
- See the **Type** associated with each domain. A type is either **Globally Shared** or **Privately Shared**. For more information about globally and locally shared domains, see [Shared Domains](#) and [Private Domains](#) in *Configuring Routes and Domains*.
- Delete a domain by clicking the vertical three-dot icon and selecting **Delete**. You must have permission to manage the domain to delete it.
- Create a new private domain by clicking **Add a Domain**. You must have Org Manager permissions to create a private domain.



To create globally shared domains, you must have Admin permissions and use the Cloud Foundry Command Line Interface (cf CLI). For more information, see [Create a shared domain](#) in *Configuring routes and domains*.

## Manage members

In the org **Members** page, you can:

- Search for members of the org
- See member email addresses
- Toggle member permissions
- Invite a new member to the org
- Remove a member from the org

## Manage settings

In the org **Settings** page, you can:

- Change the org name
- See spaces assigned to isolation segments. For more information, see [Isolation Segments in TAS for VMs Security](#).
- Delete the org. You must have admin permissions to delete an org.

## Add metadata

You can add metadata, including labels and annotations, to orgs using Apps Manager.

For more information about adding metadata to objects in VMware Tanzu Application Service for VMs (TAS for VMs), see [Using metadata](#).

To add labels or annotations to an org using Apps Manager:

1. Click the **Settings** tab of the org you want to change and go to the **Metadata** section.

Metadata	
<b>Labels</b>	<b>Annotations</b>
<input type="text"/> Name	<input type="text"/> Name
<input type="text"/> Value	<input type="text"/> Value
<input checked="" type="checkbox"/> Enter JSON	<input checked="" type="checkbox"/> Enter JSON
<b>+</b>	<b>+</b>
<b>CANCEL</b> <b>UPDATE METADATA</b>	

2. For **Labels**, fill in the **Name** and **Value** text boxes or click **Enter JSON** to enter the label in JSON.
3. For **Annotations**, fill in the **Name** and **Value** text boxes or click **Enter JSON** to enter the annotation in JSON.
4. To add more labels or annotations, click **+** next to **Labels** or **Annotations**.
5. Click **Update Metadata**.

## Manage a space

You can manage space resources, including the apps, service instances, routes, and members associated with the selected space, in Apps Manager. You can also manage space settings.

You can manage a space by navigating to the space in Apps Manager.

To go to the space, do one of the following:

- On the org page, click the name of the space you want to manage.
- Search for a space by entering its name in the search bar.

By default, the landing page for a space in Apps Manager is the space **Apps** page. You can use the panel on the left side of the screen to go to other pages for resources in the space, such as services and members.

This image shows an example of the landing page for a space in Apps Manager.

The screenshot shows the Apps Manager interface for the 'test-space' space. The left sidebar has a dark theme with white text and includes links for Space, Apps (4), Service (1), Members (35), Settings, Networking, Routes (4), and Marketplace. A 'GIVE FEEDBACK' button is at the bottom. The main content area shows the 'test-space' summary with counts for RUNNING (2), STOPPED (2), and CRASHED (0) apps. Below this is a table titled 'Apps' showing four entries:

Status	Name	Instances	Memory	Last Push	Route
● RUNNING	my-app	3	194.56 MB	2 d 3 hr	<a href="https://my-app.example.com">https://my-app.example.com</a>
■ STOPPED	my-app-2	3	768 MB	5 d 5 hr	<a href="https://my-app-2.example.com">https://my-app-2.example.com</a>
● RUNNING	my-app-3	3	768 MB	5 d 4 hr	<a href="https://my-app-3.example.com">https://my-app-3.example.com</a>
■ STOPPED	my-app-4	3	3 GB	2 mo 27 d	<a href="https://my-app-4.example.com">https://my-app-4.example.com</a>

You can manage the resources in a space using Apps Manager.

## Manage apps

The **Apps** page lists information about all apps in the space. For each app, it shows the **Status**, **Name**, number of **Instances**, amount of **Memory** available, time since the **Last Push**, and associated **Route**.

## Manage services

The **Services** page shows the **Service**, **Name**, number of **Bound Apps**, and **Plan** for each service instance in the space.

For more information about configuring services, see [Services](#).

## Manage members

The **Members** page lists all members of the space. For each member, the page also lists the associated user roles.

You can assign these user roles to space members on the **Members** page:

- **Space Manager:** Space Managers can invite and manage users in the space.
- **Space Developer:** Space Developers can create, manage, and delete apps and services in a space.
- **Space Auditor:** Space Auditors have read-only access to space details, app logs, and reports.

## Manage routes

The **Routes** page lists the routes associated with the space.

For each **Route**, the page shows the **Route Service** and **Bound Apps**. For more information about route services, see [Route Services](#).

## Manage settings

From the space **Settings** page, you can:

- Edit the space name.
- View the Application Security Groups (ASGs) associated with the space.
- View the space's isolation segment assignment. For more information, see [Isolation Segments](#) in *TAS for VMs Security*.
- Add metadata to the space. For more information, see [Add metadata](#).
- Delete the space.

## Add metadata

You can add metadata, including labels and annotations spaces using Apps Manager.

For more information about adding metadata to objects in TAS for VMs, see [Using metadata](#).

To add labels or annotations to a space using Apps Manager:

1. Click the **Settings** tab of the space you want to change and go to the **Metadata** section.
2. For **Labels**, fill in the **Name** and **Value** text boxes or click **Enter JSON** to enter the label in JSON.
3. For **Annotations**, complete the **Name** and **Value** text boxes or click **Enter JSON** to enter the annotation in JSON.
4. To add more labels or annotations, click **+** next to **Labels** or **Annotations**.
5. Click **Update Metadata**.

## Managing your user roles with Apps Manager

Here is how to manage your user roles with Apps Manager in VMware Tanzu Application Service for VMs (TAS for VMs).



The procedures described here are not compatible with using SAML or LDAP for user identity management. To create and manage user accounts in a SAML or LDAP-enabled Operations Manager deployment, see [Adding existing SAML or LDAP users to an Operations Manager deployment](#).

## Overview

Operations Manager uses role-based access control, with each role granting the permissions in either an org or an app space.

You can assign one or more roles to a user account. The combination of these roles defines the actions a user can perform in an org and within specific app spaces in that org. For information about the actions that

each role allows, see [Orgs, spaces, roles, and permissions](#). For example, to assign roles to user accounts in a space, you must have Space Manager role assigned to the user in that space.

You can also edit the permissions for existing users by adding or removing the roles associated with the user account. User roles are assigned on a per-space basis, so you must edit the user account for each space that you want to change.

Admins, Org Managers, and Space Managers can assign user roles with Apps Manager or with the Cloud Foundry Command Line Interface (cf CLI). For more information, see [Users and roles](#) in *Getting Started with the cf CLI*.

You can manage user roles across multiple foundations. For more information, see [Configuring multi-foundation support in Apps Manager](#).

## Manage org roles

Valid org roles are Organization Manager and Organization Auditor.

To grant or revoke org roles:

1. Go to the **Home** page.
2. Select an org.
3. In the panel on the left side of the screen, click **Members**. Edit the roles assigned to each user by selecting or deselecting the check boxes under each user role. Apps Manager saves your changes automatically.
4. The **Members** panel displays all members of the org. Select a check box to grant an org role to a user, or deselect a check box to revoke a role from a user.

## Manage app space roles

Valid app space roles are Space Manager, Space Developer, and Space Auditor.

To grant or revoke app space roles:

1. Go to the page for a space.
2. In the panel on the left side of the screen, click **Members**. The **Members** panel displays all members of the space.
3. Select a check box to grant an app space role to a user, or deselect a check box to revoke a role from a user.
  - **Space Managers** can invite and manage users and enable features for a space. Assign this role to managers or other users who need to administer the account.
  - **Space Developers** can create, delete, and manage apps and services, and have full access to all usage reports and logs. Space Developers can also edit apps, including the number of instances and memory footprint. Assign this role to app developers or other users who need to interact with apps and services.
  - **Space Auditors** have view-only access to all space information, settings, reports, and logs. Assign this role to users who need to view but not edit the app space.

## Invite new users



The **Enable invitations** check box in the **Apps Manager** pane of the TAS for VMs tile must be selected to invite new users.

To invite new users to an org:

1. Go to the org page.
2. In the panel on the left side of the screen, click **Members**.
3. Click **Invite New Members**. The **Invite New Team Member(s)** form appears.
4. In the **Add Email Addresses** text box, enter the email addresses of the users that you want to invite. Enter multiple email addresses as a comma-separated list.
5. The **Assign Org Roles** and **Assign Space Roles** tables list the current org and available spaces with check boxes corresponding to each possible user role. Select the check boxes that correspond to the permissions that you want to grant to the invited users.
6. Click **Send Invite**. The Apps Manager sends an email containing an invitation link to each email address that you specified.

## Remove a user from an org

Removing a user from org also removes them from all spaces in the org.

To remove a user from the org:

1. Go to the org page.
2. In the panel on the left side of the screen, click **Members**.
3. Locate the user account that you want to remove.
4. Under the user's email address, click the **Remove User** link. A warning dialog box appears.
5. Click **Remove** to confirm user account deletion from the org.

## Remove a user from a space

To remove a user from a space:

1. Go to the page for a space.
2. In the panel on the left side of the screen, click **Members**. The **Members** panel displays all members of the space.
3. Locate the user account that you want to remove.
4. Under the user's email address, click the **Remove User** link. A warning dialog box appears.
5. Click **Remove** to confirm user account deletion from the space.

## Use Apps Manager to add and bind services in TAS for VMs

You can use Apps Manager to add and bind service instances through the Marketplace for your TAS for VMs deployment. The Marketplace offers self-service, on-demand provisioning of add-on services.

For more information about how to add Managed Services to your Cloud Foundry deployment, see the [Services](#) topics.

To use a service with your application, you must access the Services Marketplace, create and configure an instance of the service, then bind the service instance to your application.

## Step 1: Access the Marketplace

Use the following steps to access the Marketplace:

1. Log in to Apps Manager for your Cloud Foundry deployment.
2. In the left pane of the page, click **Marketplace**.

You can access the Marketplace from a space page or from an app dashboard.

## Step 2: Create and configure a service instance

Use the following steps to create and configure an instance of a service:

1. In the Marketplaces, select a service.
2. Select a plan from the left column, and click **Select this plan**.
3. Complete the **Configure Instance** form with the following information:
  - **Instance Name:** Create a name for this instance of the service. Service instance names must be unique within a space.
  - **Add to Space:** From the drop-down menu, select the space where you want to add the service instance.
  - **Bind to App:** From the drop-down menu, select an app. Click **[do not bind]** if you do not want to bind the service instance to any app at this time.
4. Click **Add** to add the service instance. PWS creates the service instance in the selected space. If you specify an app, PWS binds the service instance to the app.

## Step 3: Bind a service instance to an application

Use the following steps to bind an existing service instance to an application:

1. In the **Spaces** section of the left pane, select a space.
2. In the **Apps** table of the Space page, click the row that lists the application you want to bind. The App Dashboard appears.
3. On the App Dashboard, select the **Services** tab.
4. In the Services panel, click **Bind a Service**.
5. Select a service from the **Select a service** drop-down menu. Information about the selected service appears on the right.

- If it is a shared service running in a space that you do not have access to, Apps Manager lists the space's GUID. In previous patch versions, Apps Manager listed the space's name.

6. Click **Bind**.

## Managing your apps and service instances using Apps Manager

Apps Manager allows you to view and manage apps and service instances in VMware Tanzu Application Service for VMs (TAS for VMs).

You can use Apps Manager to manage apps, service instances, service keys, and route services. This includes tasks such as scaling apps, binding apps to services, generating services keys, and more.

For information about managing orgs and spaces, see [Managing Orgs and Spaces Using Apps Manager](#).

You can manage apps and service instances across multiple foundations.

## Prerequisite for Apps Manager

To view and manage apps and service instances with Apps Manager, you must log in to Apps Manager with an account that has adequate permissions.

For more information, see [About Permissions](#) in *Getting Started with Apps Manager*.

## Manage an app

This section describes how to manage an app in Apps Manager.

You can do these tasks to manage apps in Apps Manager:

- View app summary information
- Start and stop apps
- Scale apps
- View sidecar processes
- View key app metrics
- Bind apps to services
- Manage environment variables and routes
- View logs and usage information
- View app revisions
- Re-deploy app revisions
- Delete apps
- Stop specific instances of apps

## View app overview

The **Overview** page for an app includes app summary information, such as app processes and instances, app memory and disk space, and app events.

There are two ways to locate an app **Overview** page:

- On the space page, click the app you want to manage.
- Search for an app by entering its name in the search bar.

This image shows an example of an app **Overview** page.

The screenshot shows the Tanzu Application Service for VMs v6.0 Overview page for the app "test-app".

**App Summary:**

- Instances / Allocated: 1/1
- Memory / Allocated: 0.01/0.25 GB
- Disk / Allocated: 0.01/1.00 GB
- Log Rate (per second) / Allocated: 0.00/16.00 KB

**Processes and Instances:**

web (Revision 1)						AUTOSCALING DEACTIVATED	SCALE			
Instances	Memory Allocated	Disk Allocated	Log Rate Allocated (per second)	Uptime	#	CPU Entitlement	Memory	Disk	Log Rate (per second)	Uptime
1	256 MB	1 GB	16 KB	55 min	0	3%	15.2 MB	5.17 MB	0 B	

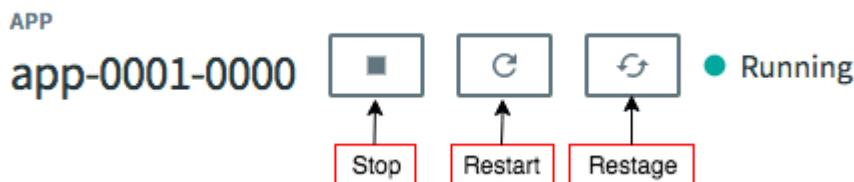
**Events:** Last Update: 10:07 AM 03/26/24

- Scaled app (admin 03/26/2024 at 10:05:54 AM)
- Mapped route to app (admin 03/26/2024 at 10:05:54 AM)
- Updated app (admin 03/26/2024 at 10:05:54 AM)
- Updated app (admin 03/26/2024 at 10:05:54 AM)
- Created app process (admin 03/26/2024 at 10:05:51 AM)

## Start, stop, or restage an app

You can start, stop, and restage from the **Overview** page of the app. The start, stop, and restage buttons are located on the app **Overview** page next to the name of the app.

This image shows the stop, restart, and restage buttons.



For more information about starting, stopping, and restaging apps with the Cloud Foundry Command Line Interface (cf CLI), see [Starting, restarting, and restaging apps](#).

## Scale an app

From the app **Overview** page, you can scale an app manually or configure App Autoscaler to scale it automatically.

## Scale an app manually

To manually scale an app:

1. Go to the app **Overview** page.
2. Under **Processes and Instances**, click **Scale** to open the scale app dialog box.

Processes and Instances						<b>AUTOSCALING DEACTIVATED</b>	<b>SCALE</b>
web (Revision 1)		Instances	Memory Allocated	Disk Allocated	Log Rate Allocated (per second)	16 KB	
#	CPU Entitlement	Memory	Disk	Log Rate (per second)	Uptime		
0	3%	15.3 MB	5.17 MB	0 B	1 hr 7 min	x	
1	5%	14.9 MB	5.17 MB	0 B	2 min	x	

3. Edit the number of **Instances**, the **Memory Limit**, the **Disk Limit**, and the **Log Rate Limit (per second)**.
4. Click **Apply Changes**.

## Activate App Autoscaler

You can activate App Autoscaler to automatically scale your apps. For information about how to configure App Autoscaler to scale an app automatically, see [Configure autoscaling for an app](#) in *Scaling an App Using App Autoscaler*.

To activate App Autoscaler for an app:

1. Go to the app **Overview** page.
2. Under **Processes and Instances**, click **AUTOSCALING DEACTIVATED** to manage autoscaling.

Processes and Instances						<b>AUTOSCALING DEACTIVATED</b>	<b>SCALE</b>
web (Revision 1)		Instances	Memory Allocated	Disk Allocated	Log Rate Allocated (per second)	16 KB	
#	CPU Entitlement	Memory	Disk	Log Rate (per second)	Uptime		
0	3%	15.3 MB	5.17 MB	0 B	1 hr 7 min	x	
1	5%	14.9 MB	5.17 MB	0 B	2 min	x	

3. Click **Activate Autoscaling** to activate App Autoscaler.

## View sidecar processes

You can view the sidecar processes associated with your app from the app **Overview** page.

To view sidecar processes associated with your apps:

1. Go to the app **Overview** page.
2. Under **Processes and Instances**, see **Sidecars**. This section only appears if your app has any sidecar processes.

Processes and Instances						AUTOSCALING DEACTIVATED	SCALE		
Instances	1	Memory Allocated	256 MB	Disk Allocated	1 GB	Log Rate Allocated (per second)	16 KB	Sidecars	1
#	CPU Entitlement	Memory	Disk	Log Rate (per second)		Uptime			
0	3%	46.4 MB	145 MB	0 B		4 min		x	
<b>Sidecars</b>									
▼ config-server									
Start Command: <code>./config-server</code>									

For more information about sidecar processes, see [Pushing apps with sidecar processes](#).

## View key metrics (beta)

If Metric Store is installed, you can view these key metrics for an app in the **Key Metrics** section of the app **Overview** page:

- CPU Entitlement
- Memory
- Disk
- Request Latency
- Request Rate
- Request Errors

For more information about each metric, see [App Metrics](#).

For each metric, the app **Overview** page includes a graph that shows metric behavior over the past three hours. You can hover over the data points on the graph to view the value of the metric. The page also includes the average value for the metric over the past three hours.

Metric Store is required for Apps Manager to display the **Key Metrics** section. For information about installing and configuring Metric Store, see [Metric Store](#).

This image is an example of an app **Overview** page, showing key metrics for the app.

Home > test-org > test-space VIEW APP

**APP** **test-app** [ ] [C] [refresh] ● RUNNING Buildpack: staticfile

**Key Metrics**

CPU Entitlement

**3.75 %**

Avg. 3 hrs

Memory

**5.95 %**

Avg. 3 hrs

Disk

**0.5 %**

Avg. 3 hrs

Request Latency

**0 ms**

Avg. 3 hrs

Request Rate

**0 /min**

Avg. 3 hrs

Request Errors

**0 /min**

Avg. 3 hrs

**Processes and Instances**

web (Revision 1)						<b>AUTOSCALING ACTIVATED</b>	<b>SCALE</b>	
Instances	2	Memory Allocated	256 MB	Disk Allocated	1 GB	Log Rate Allocated (per second)	16 KB	
#	CPU Entitlement	Memory	Disk	Log Rate (per second)	Uptime			
0	3%	15.5 MB	5.17 MB	0 B	3 hr 10 min	<span style="color: red;">×</span>		
1	3%	15 MB	5.17 MB	0 B	2 hr 5 min	<span style="color: red;">×</span>		

**App Summary**

Instances / Allocated	2/2
Memory / Allocated	0.03/0.50 GB
Disk / Allocated	0.01/2.00 GB
Log Rate (per second) / Allocated	0.00/32.00 KB

## Bind or unbind services

You can bind your app to new or existing service instances. You can also unbind your app from service instances.

### Bind an app to an existing service



For services that use asynchronous bindings, Apps Manager displays the status of the service while the bind is still pending. Asynchronous bindings provide more flexibility for services that require additional time before returning a successful bind response.

To bind your app to an existing service:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Services**.

**Bound Services**

	<b>BIND SERVICE</b>	<b>NEW SERVICE</b>
App Autoscaler free - Standard	my-autoscaler	⋮

3. Click **Bind Service**.
4. For **Service to Bind**, select the service instance from the drop-down menu.

5. (Optional) For **Binding Name**, enter a binding name in all lowercase letters. For example, `bind-usr-serv`.
6. (Optional) For **Add Parameters**, specify additional parameters.
7. Click **Bind**.

### Bind an app to a new service

To bind your app to a new service instance:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Services**.
3. Click **New Service**.

**Create a new service**

[View in Marketplace](#)

Search by name, description, or tags

	<b>App Autoscaler</b> Scales bound applications in response to load (beta)
	<b>User Provided Service</b> Add an external service to your apps

If you prefer to create the new service instance in the Marketplace, you can click **View in Marketplace** at any time.

4. Click the service.
5. Select a plan and click **Select Plan**.
6. Under **Instance Name**, enter a name for the instance.
7. (Optional) For **Binding Name**, enter a binding name in all lowercase letters. For example, `bind-usr-serv`.
8. (Optional) For **Add Parameters**, specify additional parameters. For a list of supported configuration parameters, consult the documentation for the service.
9. Click **Create**.

### Unbind a service

To unbind your app from a service instance:

1. Go to the app **Overview** page.

2. Go to **Application** and click **Services**.
3. Locate the service instance in the **Bound Services** list.
4. Click the three-dot icon.
5. Select **Unbind** from the drop-down menu.

## Map or unmap routes

The **Routes** page shows the routes associated with your app. You can use this page to map and unmap routes for your app.

### Map routes

To map routes to your app:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Networking**, click **Routes**.
3. To add a new route, click **Map a Route**.



4. Enter the route and click **Map**.

### Unmap routes

To unmap a route from your app:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Networking**, click **Routes**.
3. Locate the route from the list and click the **x**.
4. Click **Unmap** in the pop-up window to confirm.

## Create container-to-container networking policies

Container networking policies enable app instances to communicate with each other directly. You can create container networking policies in the **Networking** tab.

For more information about container-to-container networking in Operations Manager, see [Container-to-Container Networking](#).



To view and use the **Networking** tab, you must have either the `network.write` or `network.admin` UAA scope. If you do not see the **Networking** tab, request one of the previous scopes from your Operations Manager administrator.

To create container-to-container networking policies:

1. Go to the app **Overview** page.

2. In the panel on the left side of the page, under **Networking**, click **Container Networking**. The page displays any container networking policies associated with the app.
3. To add a new network policy, click **Create Policy** or **Add a network policy**.
4. In the **Add Policy** window:
  - For **Org**, select the org of the destination app.
  - For **Space**, select the space of the destination app.
  - For **App**, select the destination app.
  - For **Protocol**, select **TCP** or **UDP**.
  - For **Ports**, enter the ports at which to connect to the destination app. The allowed range is from [1](#) to [65535](#). You can specify a single port, such as [8080](#), or a range of ports, such as [8080-8090](#).
5. Click **Save**.

## Manage app revisions

A revision represents code and configuration used by an app at a specific time. It is a Cloud Foundry API (CAPI) object that can contain references to a droplet, custom start command, and environment variables. The most recent revision for a running app represents code and configuration currently running in Operations Manager.

You can view revisions, list environment variables associated with revisions, and re-deploy previous revisions in the **Revisions** tab.

For more information about app revisions in Operations Manager, see [App Revisions](#).

### View app revisions

To list revision history for an app, including both current and stopped revisions:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Revisions**.
3. View app revisions in the **Revisions** table.

### List environment variables for an app revision

To list environment variables associated with an app revision:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Revisions**.
3. In the **Revisions** table, select the row that contains the revision. The row expands to reveal metadata and environment variables associated with the revision.

### Roll back to a previous app revision

To roll back an app to a previous revision:

1. Go to the app **Overview** page.

2. In the panel on the left side of the page, under **Application**, click **Revisions**.
3. In the **Revisions** table, select the row that contains the revision you want to roll back to. The row expands to reveal metadata.
4. Click **Reread**.

## View logs

You can view logs for an app in Apps Manager. You can also use Apps Manager to view a live stream of app logs.

To view logs for an app:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Observability**, click **Logs**.
3. Click the Play button to view a live version of the logs.

## Manage tasks

The **Tasks** page includes jobs and tasks associated with an app. It displays a table containing **Task ID**, **State**, **Start Time**, **Task Name**, and **Command**.

From the **Tasks** page, you can view tasks, run tasks, and enable task scheduling.

### View tasks

You can view tasks for an app on the Tasks page in Apps Manager.

To access the **Tasks** page:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Tasks**.

### Run a task

To run a task for an app:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Tasks**.
3. Click **Run Task** to create a task.

## x Create Task

**Task Name (Optional)**

**Task Command**

**Memory Limit**

1 GB ▼

**Disk Limit**

1 GB ▼

[VIEW CF CLI COMMAND](#)

CANCEL

RUN

4. (Optional) Enter a **Task Name**.
5. Enter the **Task Command**.
6. Select a **Memory Limit** and a **Disk Limit** for the task.
7. Click **Run**.

**Enable task scheduling**

In the **Tasks** tab, click **Enable Scheduling** to bind the Scheduler service to your app. For more about Scheduler, see [Scheduling jobs](#) in the Scheduler documentation.

The screenshot shows a dashboard with two main sections: 'Jobs' and 'Tasks'. The 'Jobs' section contains a message: 'The scheduler service has not been enabled yet.' with a 'ENABLE SCHEDULING' button. The 'Tasks' section contains a message: 'No tasks have run for this application.' with a 'RUN TASK' button.

## Schedule a task

To schedule a task:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Tasks**.
3. Click **Create Job** to schedule a task.

The 'Create Job' dialog box contains fields for 'Job Name', 'Command', and 'Cron Expressions'. It includes a 'Value' input field with a '+' button for adding more cron expressions, and a note about cron expression syntax. A 'CREATE JOB' button is at the bottom.

4. Enter a **Job Name**.
5. Enter a **Command**.
6. Enter one or more **Cron Expressions** for the task schedule or schedules you want. For more information about cron expression syntax, see [Scheduling jobs](#) in the Scheduler documentation.
7. Click **Create Job**.

## View and manage settings

To view settings for an app, in the panel on the left side of the page, under **Application**, click **Settings**.

You can do the these tasks from the **Settings** page:

- Rename the app.
- View information about the buildpacks, start command, and stack.
- Configure health checks.
- View or add Environment Variables associated with the app.
- Add metadata to the app.
- View the App Security Groups (ASGs) associated with the app.
- Delete the app. When you click **Delete App**, you also have the option to delete the app's routes.

## Configure health checks

To configure health checks for your app:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Settings**.
3. In the **Health Check** section, click the **Type** drop-down menu and select **port**, **http**, or **process**. Depending on which option you select, additional text boxes might appear.
4. For **Type**, select **port**, **http**, or **process**.
5. Complete the text boxes that appear based on your selection.
6. Click **Update**.

For more information, see [Using app health checks](#).

## View environment variables

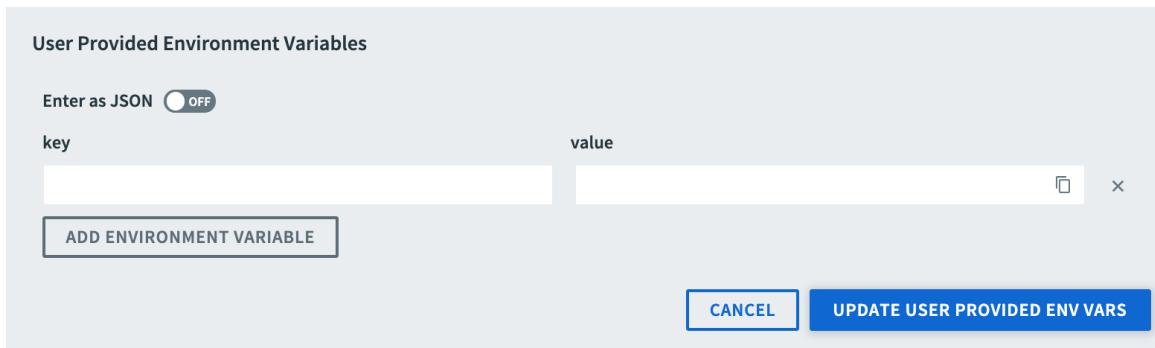
To view all environment variables for an app:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Settings**.
3. Under **User Provided Environment Variables**, click **Reveal Env Vars**.

## Add environment variables

To add a user-provided environment variable:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Settings**.
3. Click **Reveal User Provided Env Vars**.
4. Click **Add Environment Variable**.
5. Enter the **key** and **value** of the variable. Alternatively, toggle **Enter as JSON** to enter the variable in JSON.



6. Click **Save**.



Changes to environment variables, service bindings, and service unbindings require restarting the app to take effect. You can restart the app from Apps Manager or with the Cloud Foundry CLI `cf restage` command.

## Add metadata

You can add metadata, including labels and annotations, to apps and spaces using Apps Manager.

For more information about adding metadata to objects in VMware Tanzu Application Service for VMs (TAS for VMs), see [Using metadata](#).

To add labels or annotations to an app using Apps Manager:

1. Go to the app **Overview** page.
2. In the panel on the left side of the page, under **Application**, click **Settings**.
3. For **Labels**, provide a name and value pair or click **Enter JSON** to enter the label in JSON.
4. For **Annotations**, provide a name and value pair or click **Enter JSON** to enter the annotation in JSON.
5. To add more labels or annotations, click **+** next to **Labels** or **Annotations**.
6. Click **Update Metadata**.

## Manage a service instance

This section describes how to manage service instances in Apps Manager.

You can do these tasks to manage service instances in Apps Manager:

- Bind or unbind apps.
- Bind or unbind routes.
- View or change your service plan.
- Manage service keys.
- Rename or delete your service instance.



For services that use on-demand brokers, the service broker creates, updates, or deletes the service instance in the background and notifies you when it finishes.

## View service overview

The **Overview** page for a service instance includes information about bound apps, bound routes, and service key credentials for the service.

To locate the service instance **Overview** page:

1. Go to the landing page for the space of the service instance.
2. In the panel on the left side of the page, under **Space**, click **Services**.
3. On the **Services** page, click the name of the service instance.

[Home](#) / [test-space](#)

SPACE	RUNNING	STOPPED	CRASHED
test-space	● 77	■ 69	▼ 0

### Space Name

test-space

[CANCEL](#)

[UPDATE SPACE NAME](#)

### Metadata

#### Labels

[ADD LABEL](#)

#### Annotations

[ADD ANNOTATION](#)

[CANCEL](#)

[UPDATE METADATA](#)

### Security Groups

A collection of egress rules that specify one or more individual protocols, ports, and destinations. [Learn more about Security Groups](#)

> dns  
running, staging

> ssh-logging  
running

### Isolation Segment Assignment

none

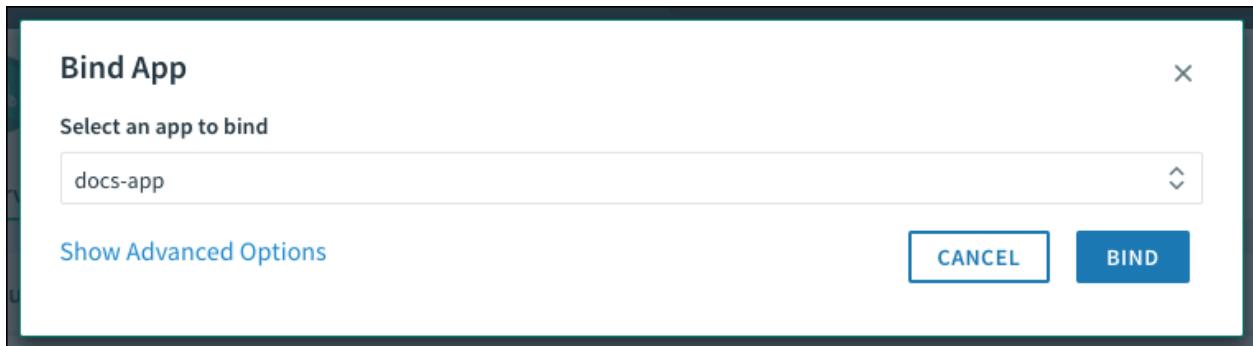
## Bind an app



For services that use asynchronous bindings, Apps Manager displays the status of the service while the bind is still pending. Asynchronous bindings provide more flexibility for services that require additional time before returning a successful bind response.

To bind an app to a service:

1. On the service **Overview** page, click **Bind App**.
2. In the **Bind App** pop-up window, select the app to bind to the service instance.

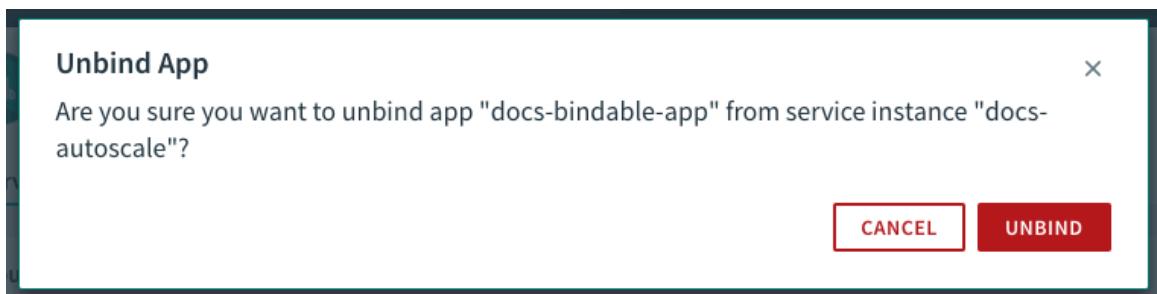


1. (Optional) To attach parameters to the binding, click **Show Advanced Options**. Under **Arbitrary Parameters**, enter any additional service-specific configuration.
2. Click **Bind**.

## Unbind an app

To unbind an app from a service instance:

1. On the service **Overview** page, go to **Bound Apps**, and click the **x** to the right of the app name. An **Unbind App** pop-up appears.



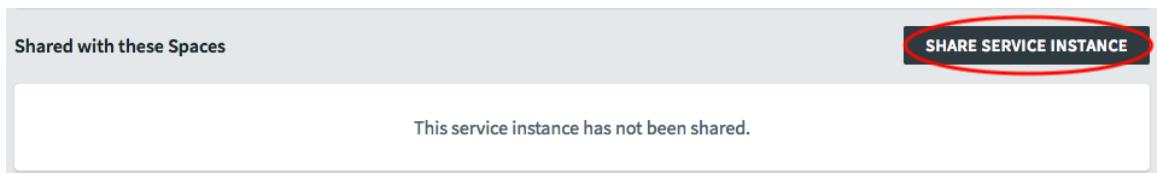
2. Click **Unbind** to confirm.

## Share service instance

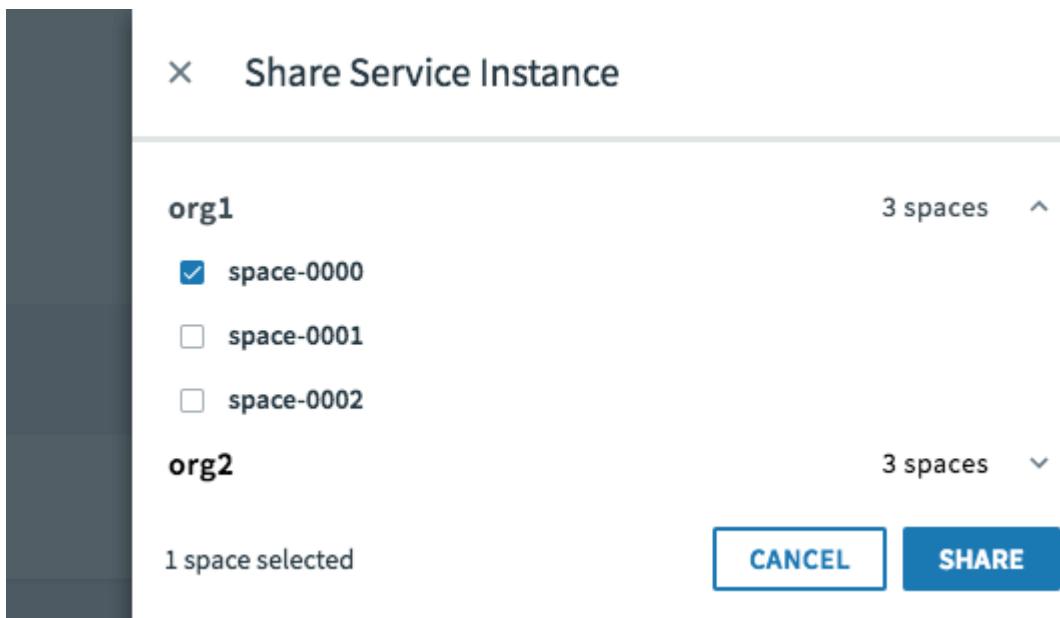
From the service **Overview** page, you can share your service instance across spaces.

To share a service instance:

1. On the service **Overview** page, click **Share Service Instance**.



2. Select the spaces with which you want to share your service instance.



3. Click **Share**.

## View or change your service plan

To view or change your service plan:

1. Go to the service **Overview** page.
2. In the panel on the left side of the page, under **Service**, click **Plan**.
3. Review your current plan information.
4. To change your plan, select a new plan from the list and click **Select This Plan** or **Upgrade Your Account**. Not all services support upgrading. If your service does not support upgrading, the service plan page only displays the selected plan.

## Rename or delete your service instance

To rename or delete your service instance:

1. Go to the service **Overview** page.
2. In the panel on the left side of the page, under **Service**, click **Settings**.

[Home](#) / [test-org](#) / [test-space](#)

The screenshot shows a service instance configuration page for 'elastic.co'. At the top, there's a logo for 'elastic.co' and a status message 'SERVICE: User Provided'. Below this, a 'Service Instance Name' field contains 'elastic.co'. There are 'CANCEL' and 'UPDATE SERVICE INSTANCE NAME' buttons. A 'Delete Service Instance' section follows, with a warning message: 'This will permanently delete the service and all of its data.' and a red 'DELETE SERVICE INSTANCE' button.

3. Do one of these steps:

- To change the service instance name, enter the new name and click **Update**.
- To add configuration parameters to the service instance, enter the parameters in the **Name** and **Value** text boxes and then click **Update**. Alternatively, enter your configuration parameters using the **Enter JSON** toggle and then click **Update**.
- To delete the service instance, click **Delete Service Instance**.



The service broker supports creating, updating, and deleting service instances asynchronously. When the service broker completes one of these operations, a status banner appears in Apps Manager.

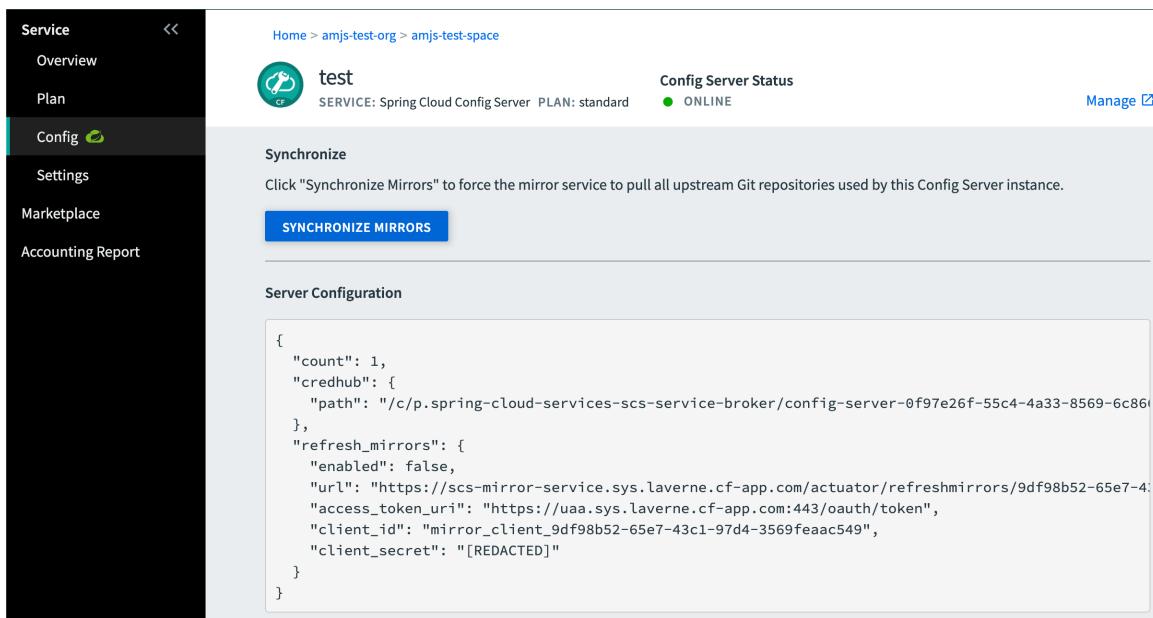
## View and update spring cloud services configurations

For Spring Cloud Services (SCS) Config Server instances, Apps Manager lets you:

- See the Git repos that the SCS Config Server uses to configure the client apps that it serves. For more information, see the [Spring Cloud Services for VMware Tanzu Documentation](#).
- Update client app configurations, by updating the local mirrors of their configuration repos.
- See the current status and configuration of the SCS Config Server itself.

To see and update this configuration and status information for an SCS Config Server instance:

1. Go to the service **Overview** page.
2. In the panel on the left side of the page, under **Service**, click **Config**. The **Configuration** pane appears only for Spring Cloud Services instances.



The **Config** pane includes:

- The current status of the SCS Config Server
- The JSON object that configures settings for the SCS Config Server
  - Passed in with `-c` flag to `cf create-service` and `cf update-service`
- A **Synchronize Mirrors** button for the app configurations that the SCS Config Server serves
  - Click this button to refresh the local Git repository mirrors. Refreshing the mirrors updates client app configuration settings, as described in [Config Server mirror service](#) in the SCS documentation.
- A **Manage** link to the SCS Config Server dashboard, at the `/dashboard` URL endpoint of the SCS service instance
  - Click this link to see the Git repos that the SCS Config Server uses to configure its apps.
  - For more information about the SCS Config Server dashboard, see [Using the dashboard](#).

## Configure user-provided service instance

You can create a user-provided service instance from the Marketplace. For more information, see [User-Provided Service Instances](#).

To configure settings for a user-provided service instance:

1. Go to the service **Overview** page.
2. In the panel on the left side of the page, under **Service**, click **Configuration**. The **Configuration** pane only appears for user-provided service instances.

[Home](#) / [test-org](#) / [test-space](#)

The screenshot shows the configuration page for a service named 'elastic.co'. At the top, it says 'SERVICE: User Provided'. Below that is a 'Configuration' section with 'Credential Parameters (Optional)'. It includes fields for 'key' and 'value' pairs, with examples like 'sslUri' and 'uri'. There's also an 'ADD PARAMETER' button. Below this are optional fields for 'Syslog Drain Url' and 'Route Service Url'. At the bottom right are 'CANCEL' and 'UPDATE SERVICE' buttons.

3. Enter the **Credential Parameters**, **Syslog Drain Url**, and **Route Service Url**.
4. Click **Update Service**.

## Manage service keys

To manage service keys:

1. Go to the service **Overview** page.
2. Go to **Service Key Credentials**, generate a new service key, get the credentials for a service key, or delete a service key.

## Generate a service key

To generate a new service key:

1. Go to the service **Overview** page.
2. Go to **Service Key Credentials**, and click **Create Service Key**.
3. Enter a **Service Key Name**.

The dialog box is titled 'Create Service Key'. It has a 'Service Key Name' field with a placeholder 'Service Key Name'. At the bottom are 'Show Advanced Options', 'CANCEL', and 'CREATE' buttons.

4. (Optional) Click **Show Advanced Options**. Under **Arbitrary Parameters**, enter any additional service-specific configuration in **Name** and **Value**.

**Create Service Key**

Service Key Name

Arbitrary Parameters

Enter JSON

Name	Value	+
------	-------	---

Hide Advanced Options

CANCEL CREATE

5. Click **Create** to generate the service key.

## View credentials for a service key

To view the credentials for a service key:

1. Go to the service **Overview** page.
2. Go to **Service Key Credentials**, and click the service instance name. The JSON object containing the credentials appears.

**Service Key Credentials**

external-app

```
{
  "hostname": "external-app.com",
  "password": "*****",
  "port": "12345"
}
```

Close

3. Click **Close**.

## Delete service key

To delete a service key:

1. Go to the service **Overview** page.
2. Go to **Service Key Credentials**, and click the **x** next to the service instance name.

The screenshot shows a table header 'Service Key Credentials' and a single row containing 'external-app'. A red 'X' icon is located at the end of the row.

Service Key Credentials	
external-app	<span style="color: red;">X</span>

## Manage route services

You can bind a new service instance to a route when you create the instance in the Marketplace, or you can manage route services for an existing service instance on the service instance page.

For more information about route services, see [Route Services](#).

### Bind a new service instance to a route

To bind a new service instance to a route:

1. Select the service from the Marketplace.

The dialog box has sections for 'Instance Name', 'Add to Space', 'Bind to App' (with a '[do not bind]' option), and 'Bind to Route' (with a '[do not bind]' option and a 'CREATE ROUTE' button). At the bottom are 'SHOW ADVANCED OPTIONS', 'CANCEL', and 'ADD' buttons.

**Configure Instance**

**Instance Name**  
[ ]

**Add to Space**  
[ ]

**Bind to App**  
[do not bind]

**Bind to Route**  
[do not bind] **CREATE ROUTE**

**SHOW ADVANCED OPTIONS** **CANCEL** **ADD**

2. Under **Bind to Route**, either bind the service instance to an existing route or click **Create Route** to create a new custom route. You must choose a Marketplace service compatible with route services for the **Bind to Route** text box to appear.
3. Fill in the remaining text boxes and click **Add** to create the service instance.

### Bind an existing service instance to a route

To bind an existing service instance to a route:

1. Go to the service **Overview** page.
2. Go to **Bound Routes**, and click **Bind Route**.

If the service is not compatible with route services, the text "This service does not support route binding" appears under **Bound Routes**.

3. Do one of these steps:
  - For **Select a route to bind**, select an existing route.
  - For **Create Custom Route**, enter a new route.
4. Click **Bind**.

## Unbind a route from a service instance

To unbind a route from a service instance:

1. Go to the service **Overview** page.
2. Go to **Bound Routes**, and click the **x** next to the name of the route.

## Viewing your ASGs in Apps Manager

Application Security Groups (ASGs) are collections of egress rules that specify the protocols, ports, and IP address ranges where app or task instances send traffic. Apps Manager sets up rules to filter and log outbound network traffic from app and task instances in VMware Tanzu Application Service for VMs (TAS for VMs). ASGs apply to both buildpack-based and Docker-based apps and tasks.

When apps or tasks begin staging, they need traffic rules permissive enough to allow them to pull resources from the network. After an app or task is running, the traffic rules can be more restrictive and secure. To distinguish between these two security requirements, administrators can define one ASG for app and task staging, and another for app and task runtime. For more information about staging and running apps, see [Application container lifecycle](#).

To provide granular control when securing a deployment, an administrator can assign ASGs to apply to all app and task instances for the entire deployment, or assign ASGs to spaces to apply only to apps and tasks in a particular space.

Only admin users can create and edit ASGs. For information about creating and configuring ASGs, see [App Security Groups](#).

## Displaying ASGs for a space

To view the ASGs associated with a space, follow these steps.

1. Log in to Apps Manager.
2. From the **Home** page, select the **Org** that contains the space you want to view.
3. Select the **Space** you want to view.
4. Click the **Settings** tab.
5. In the **Security Groups** section, Apps Manager displays ASGs associated with the selected space.
6. Click an ASG to expand its egress rules.

**Security Groups**  
A collection of egress rules that specify one or more individual protocols, ports, and destinations. [Learn more](#)

- ▼ **public\_networks**  
running, staging
  - destination: 0.0.0.0-9.255.255.255  
protocol: all
  - destination: 11.0.0.0-169.253.255.255  
protocol: all
  - destination: 169.255.0.0-172.15.255.255  
protocol: all
  - destination: 172.32.0.0-192.167.255.255  
protocol: all
  - destination: 192.169.0.0-255.255.255.255  
protocol: all
- **dns**  
running, staging
- **sshfs-service**  
running
- **p-mysql**  
running

## Configuring your Spring Boot Actuator endpoints for Apps Manager

The Apps Manager UI supports several production-ready endpoints from Spring Boot Actuator. This topic describes the Actuator endpoints and how you can configure your VMware Tanzu Application Service for VMs (TAS for VMs) app to display data from the endpoints in Apps Manager.

For more information about Spring Boot Actuator, see the [Spring Boot Actuator documentation](#).



This feature requires Spring Boot v1.5 or later.

## Overview

The Apps Manager integration with Spring Boot does not use the standard Spring Boot Actuators. Instead, it uses a specific set of actuators that are secured using the Space Developer role for the space that the application runs in. Authentication and authorization are automatically delegated to the [Cloud Controller](#) and the [User Account and Authentication](#) server without any configuration from the user.

By default, actuators are secure and cannot be accessed without explicit configuration by the user, even if [Spring security](#) is not included. This allows users to take advantage of the Spring Boot Apps Manager integration without accidentally exposing their actuators without security.

## Actuator endpoints

The table below describes the Spring Boot Actuator endpoints supported by Apps Manager. To integrate these endpoints with Apps Manager, you must first [Activate Spring Boot Actuator for Your App](#).

Endpoint	About
/info	<ul style="list-style-type: none"> <li><b>Description:</b> Exposes details about app environment, Git, and build. To send build and Git information to this endpoint, see <a href="#">Configure the Info Actuator</a>.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">View Build and Git Information for Your App</a>.</li> </ul>
/health	<ul style="list-style-type: none"> <li><b>Description:</b> Shows health status or detailed health information over a secure connection. Spring Boot Actuator includes the auto-configured health indicators specified in the <a href="#">Auto-configured HealthIndicators</a> section of the Spring Boot documentation. To write custom health indicators, see the <a href="#">Writing custom HealthIndicators</a> section of the Spring Boot documentation.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">View App Health</a>.</li> </ul>
/loggers	<ul style="list-style-type: none"> <li><b>Description:</b> Lists and allows modification of the levels of the loggers in an app.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">Manage Log Levels</a>.</li> </ul>
/dump	<ul style="list-style-type: none"> <li><b>Description:</b> Generates a thread dump.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">View Thread Dump</a>.</li> </ul>
/trace	<ul style="list-style-type: none"> <li><b>Description:</b> Displays trace information from your app for each of the last 100 HTTP requests. For more information, see the <a href="#">Tracing</a> section of the Spring Boot documentation.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">View Request Traces</a>.</li> </ul>
/heapdump p	<ul style="list-style-type: none"> <li><b>Description:</b> Generates a heap dump and provides a compressed file containing the results.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">Download Heap Dump</a>.</li> </ul>
/mapping s	<ul style="list-style-type: none"> <li><b>Description:</b> Displays the endpoints an app serves and other related details.</li> <li><b>How to use in Apps Manager:</b> See <a href="#">View Mappings</a>.</li> </ul>

## Activate Spring Boot actuator for your app

You must add a `spring-boot-starter-actuator` dependency to your app project for the production-ready HTTP endpoints to return values. For more information, see the [Enabling production-ready features](#) section of the Spring Boot documentation.

- Follow the instructions below that correspond to your project type.

- Maven:** If you use Maven, add the following to your project:

```
<dependencies>
  <dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-actuator</artifactId>
  </dependency>
</dependencies>
```

- Gradle:** If you use Gradle, add the following to your project:

```
dependencies {
  compile("org.springframework.boot:spring-boot-starter-actuator")
}
```

- If you use self-signed certificates in your Operations Manager deployment for UAA or the Cloud Controller, specify in your `application.properties` file to skip SSL validation:

```
management.cloudfoundry.skip-ssl-validation=true
```

For more information, see [Cloud Foundry support](#) in the Spring Boot Actuator documentation.

## Configure the Info Actuator

The `/info` endpoint provides information about the project build for your app, and its Git details.

### Add build information

To add build information to the `/info` endpoint, follow the instructions below that correspond to your project type.

#### Maven

Add the following to your app project:

```
<build>
  <plugins>
    <plugin>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-maven-plugin</artifactId>
      <version>1.4.2.RELEASE</version>
      <executions>
        <execution>
          <goals>
            <goal>build-info</goal>
          </goals>
        </execution>
      </executions>
    </plugin>
  </plugins>
</build>
```

## Gradle

Add the following to your app project:

```
springBoot {
    buildInfo()
}
```

## Add Git information

To add Git information to the `/info` endpoint, follow these instructions:

1. Add the following property to your `application.properties` file:

```
management.info.git.mode=full
```

2. Follow the instructions below that correspond to your project type.

## Maven

Add the following plug-in to your project:

```
<build>
    <plugins>
        <plugin>
            <groupId>pl.project13.maven</groupId>
            <artifactId>git-commit-id-plugin</artifactId>
        </plugin>
    </plugins>
</build>
```

## Gradle

Add the following plug-in to your project:

```
plugins {
    id "com.gorylenko.gradle-git-properties" version "1.4.17"
}
```

# Using Spring Boot Actuators with Apps Manager

Apps Manager for VMware Tanzu Application Service for VMs (TAS for VMs) views and manages app information from Spring Boot Actuator.

## Prerequisites

The Apps Manager integration with Spring Boot Actuator requires:

- A TAS for VMs user with the `SpaceDeveloper` role. For more information, see [App Space Roles](#).
- Spring Boot v1.5 or later.
- Completing the procedures in [Configure Spring Boot Actuator Endpoints for Apps Manager](#).

After you configure your app, Apps Manager displays the Spring Boot logo next to the name of your app on the app page.

The screenshot shows the 'APP' section of the interface. At the top, there's a green circle with a white power icon followed by the app name 'hello-spring-cloud'. To the right of the name are three small icons: a grey square with a black square inside, a blue square with a white circle inside, and a green circle with a white dot inside. Next to the green circle is the status 'Running'. Below this, a horizontal navigation bar contains seven tabs: 'Overview' (underlined in blue), 'Services', 'Route (1)', 'Logs', 'Tasks', 'Trace', 'Threads', and 'Settings'.

## View build and Git information for your app

To view the data that your app sends to its `/info` Actuator endpoint, click the **Settings** tab.

**App Name**  **UPDATE** **CANCEL**

---

**Info**

```
Buildpack: java_buildpack_offline
Start Command: CALCULATED_MEMORY=$(PWD/.java-buildpack/open_jdk_jre/bin/java-buildpack-memory-calculator-2.0.2_RELEASE -memorySizes=metaspace:64m..,stack:228k.. -memoryWeights=heap:65,metaspace:10,native:15,stack:10 -memoryInitials=heap:100%,metaspace:100% -stackThreads=300 -totMemory=$MEMORY_LIMIT) && JAVA_OPTS="-Djava.io.tmpdir=$TMPDIR -XX:OnOutOfMemoryError=$PWD/.java-buildpack/open_jdk_jre/bin/killjava.sh $CALCULATED_MEMORY -Djavax.net.ssl.trustStore=$PWD/.java-buildpack/container_certificate_trust_store/truststore.jks -Djavax.net.ssl.trustStorePassword=java-buildpack-trust-store-password" && SERVER_PORT=$PORT eval exec $PWD/.java-buildpack/open_jdk_jre/bin/java $JAVA_OPTS -cp $PWD/. org.springframework.boot.loader.JarLauncher
Stack: cflinuxfs2 (Cloud Foundry Linux-based filesystem)
Health check type: port
```

---

**Spring Info** **VIEW RAW JSON**

**Git**

SHA: [c91dff0](#)  
Message: "Skip SSL validation [#137189187]"  
Date: 01/06/17 08:50PM UTC  
Email: jberney@users.noreply.github.com

**Build**

Remote: git@github.com:pivotal-cf/spring-actuator-acceptance.git  
Time: 04/21/17 09:03PM UTC  
Name:  
User Email: Pivotal Default

---

**User Provided Environment Variables** **REVEAL USER PROVIDED ENV VARS**

---

**Environment Variables** **REVEAL ENV VARS**

Defined by the runtime and buildpack. [Learn more](#)

---

**Security Groups**

A collection of egress rules that specify one or more individual protocols, ports, and destinations. [Learn more](#)

➤ default\_security\_group  
running, staging

---

**Delete App** **DELETE APP**

This will permanently delete the app and all of its data.

In the upper right of the app page, Apps Manager displays the SHA of your app code repository from the latest build.

Git: [9c91991](#) ↗  
Buildpack: <https://github.com/cl...>

## View app health

To view the health check data that your app sends to its `/health` Actuator endpoints:

1. Select the **Overview** tab.
2. Click an instance under the **Instances** section. The health check details are displayed.

#	App Health	CPU	Memory	Disk	Uptime
0	Up	0%	209.97 MB	137.75 MB	1 min

**Health Check**

```

status: UP
diskSpace
  status: UP
  free: 912412672
  threshold: 10485760
  total: 1056858112
mySql
  status: UP
  database: MySQL
  timestamp: Thu May 11 18:44:46 UTC 2017
postgreSql
  status: UP
  database: PostgreSQL

```

## View thread dump

To trigger and view a thread dump from your app to its `/dump` Actuator endpoint:

1. Select the **Threads** tab.
2. Click **Refresh**.

Instance	Show	Last refresh	REFRESH
0	ALL	05/08/17 16:48 PM	

**container-0**

```

"container-0" #15
  java.lang.Thread.State: TIMED_WAITING (sleeping)
  at java.lang.Thread.sleep(Native Method)
  at org.apache.catalina.core.StandardServer.await(StandardServer.java:427)
  at org.springframework.boot.context.embedded.tomcat.TomcatEmbeddedServletContainer$1.run(TomcatEmbeddedServletContainer.java:100)

  Locked ownable synchronizers:
  - None

```

> ContainerBackgroundProcessor[StandardEngine[Tomcat]]

> DestroyJavaVM

> Finalizer

> http-nio-8080-Acceptor-0

You can click each thread to expand and view its details. You can also change which threads appear on the page using the **Instance** and **Show** drop-down menus.

## View request traces

To retrieve and view tracing information from the `/trace` Actuator endpoint of your app:

1. Select the **Trace** tab.
2. Click **Refresh**.

The screenshot shows the Tanzu Application Service for VMs interface with the 'amjs-test-spring-app' application selected. The 'Trace' tab is active. At the top, there are buttons for stopping and starting the app, and a status indicator showing it is 'Running'. Below the tabs, there is a dropdown for 'Instance' set to 'ALL' and a checked checkbox for 'Hide Pivotal Apps Manager Requests'. The main area lists requests with their timestamp, status code, method, and URL. One request is expanded to show its full trace details, including the 'Request' and 'Response' headers and bodies. The 'Request' section shows various standard HTTP headers like Host, User-Agent, Accept, Accept-Encoding, Accept-Language, Access-Control-Request-Headers, Access-Control-Request-Method, Origin, Via, X-B3-Spanid, X-B3-Traceid, X-Cf-Applicationid, X-Cf-InstanceId, X-Cloud-Trace-Context, X-Forwarded-For, X-Forwarded-Proto, X-Request-Start, X-Vcap-Request-Id, and Connection. The 'Response' section shows X-Application-Context, Access-Control-Allow-Origin, Vary, Access-Control-Allow-Methods, Access-Control-Allow-Headers, Allow, and Status. Below the expanded request, a list of other recent requests is shown, each with a small arrow icon indicating they can be expanded.

This page displays the last 100 requests from your app. You can click each individual request to expand and view its trace details. You can change which requests appear on the page using the **Instance** drop-down menu.

By default, the **Trace** tab does not show requests and responses from Apps Manager polling app instances for data. To include these requests, deselect the **Hide Apps Manager Requests** check box next to the **Instance** drop-down menu.

## Download heap dump

To trigger and view a heap dump from your app to its `/heapdump` endpoint.

1. Select the settings drop-down menu for an instance of your app.
2. Click **Heap Dump**. This downloads a `.zip` file.

The screenshot shows the 'Instances' section of the Tanzu Application Service for VMs interface. A table displays resource usage for one instance:

#	App Health	CPU	Memory	Disk	Uptime
0	Up	27%	206.21 MB	137.75 MB	1 hr 11 min

A context menu is open on the right side of the table, listing three options: 'Heap Dump', 'View Trace', and 'View Threads'. The 'Heap Dump' option is highlighted.

## View mappings

To view a collated list of the endpoints an app serves:

1. Select the **Settings** tab.
2. Click **View Mappings**.

The screenshot shows the 'Settings' tab of the Apps Manager interface. At the top, there is a 'App Name' input field containing 'docs-spring-app' with 'UPDATE' and 'CANCEL' buttons. Below this, the 'Info' section displays build details: Buildpack: java\_buildpack\_offline, Start Command: (empty), Stack: cflinuxfs2 (Cloud Foundry Linux-based filesystem), and Health check type: port. A toggle switch for 'Metrics Forwarder' is shown as off. The 'Spring Info' section shows a green gear icon, a 'VIEW RAW JSON' button, and Git metadata: SHA: c91dff0, Message: "Skip SSL validation [#137189187]", Date: 01/06/17 08:50PM UTC, Email: jberney@users.noreply.github.com, Remote: git@github.com:pivotal-cf/spring-actuator-acceptance.git, Time: 04/21/17 09:03PM UTC, and Name: Pivotal Default. The 'Build' section also lists User Email: Pivotal Default. At the bottom, a 'Mappings' section has a 'VIEW MAPPINGS' button.

## Manage log levels for apps mapped to external routes

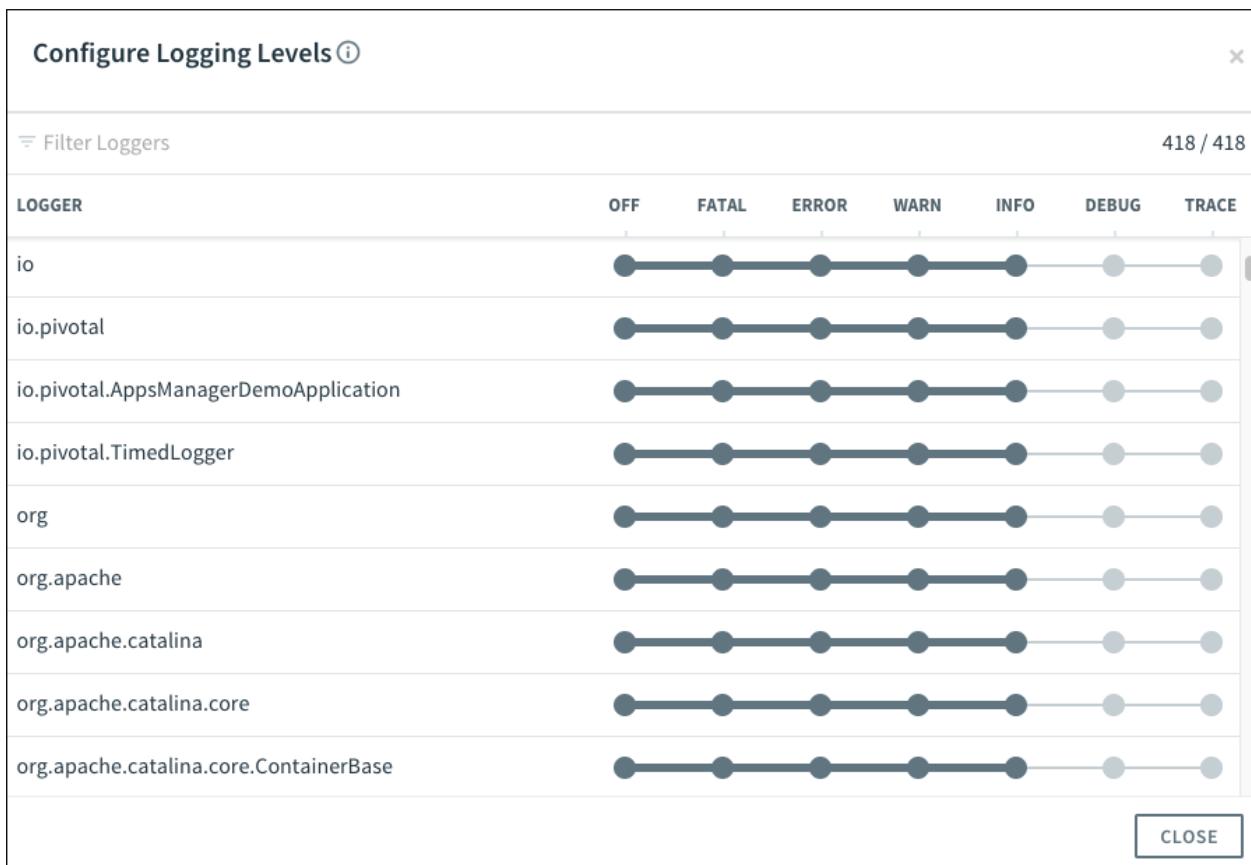
Spring Boot apps include *loggers* for many provided and user components of the app. You can set the log level for each logger in Apps Manager.

To view the **Configure Logging Levels** screen:

1. Select the **Logs** tab.
2. Click **Configure Logging Levels**.

The screenshot shows the 'Logs' tab of the Apps Manager interface. It displays a log entry: /2017-05/05/05/05/05/app\_1.log. The log message is: "x b3 traceid:"31af4c2016156a89" x b3 spanid:"31af4c2016156a89" x b3 parentspanid:"-". To the right of the log, there is a 'CONFIGURE LOGGING LEVELS' button and a small play icon.

Apps Manager displays the default log level for each logger in gray.

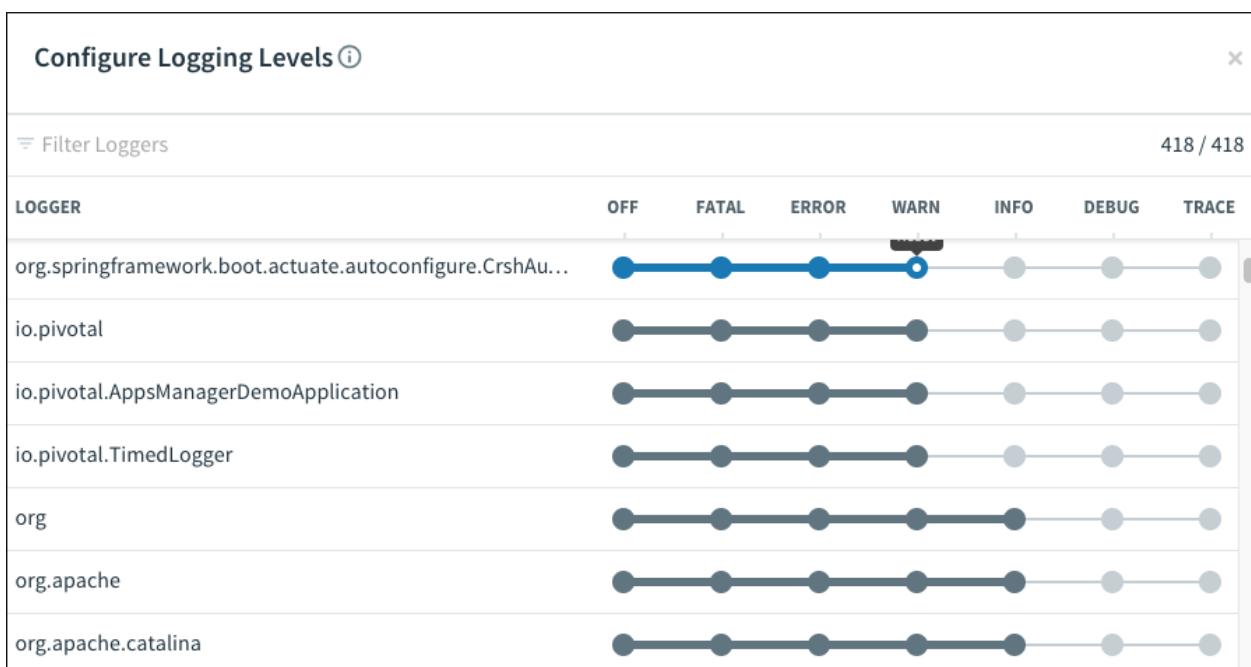


You can edit the log level for a logger by clicking the level you want in the logger row, as shown in the following image. Whenever you set a log level, the following happens:

- The log level displays in blue to indicate that it is user-configured.
- Each child namespace of the logger inherits the log level.



You can manually set any of the child loggers to override this inheritance.



All of the loggers with user-configured logging levels float to the top of the list.

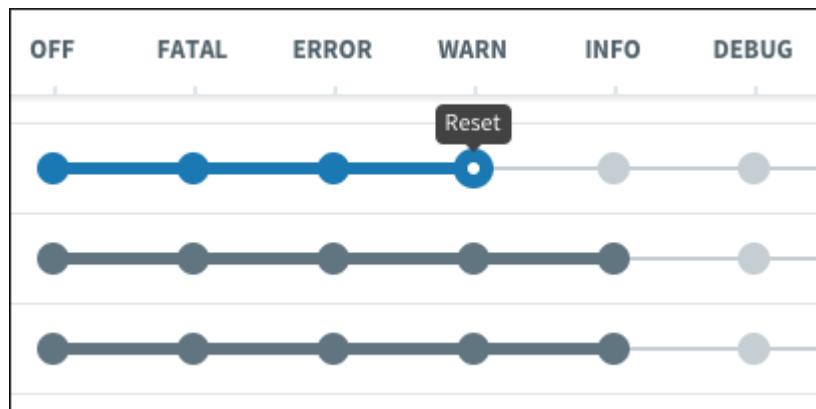
**Configure Logging Levels** ⓘ

Filter Loggers 418 / 418

LOGGER	OFF	FATAL	ERROR	WARN	INFO	DEBUG	TRACE
ROOT	●	●	●	●	●	●	●
io.pivot.al	●	●	●	●	●	●	●
io.pivot.al.AppsManagerDemoApplication	●	●	●	●	●	●	●
org.apache.catalina.startup.DigesterFactory	●	●	●	●	●	●	●
org.apache.catalina.util.LifecycleBase	●	●	●	●	●	●	●
org.apache.coyote.http11.Http11NioProtocol	●	●	●	●	●	●	●
org.apache.sshd.common.util.SecurityUtils	●	●	●	●	●	●	●
org.apache.tomcat.util.net.NioSelectorPool	●	●	●	●	●	●	●
org.crsh.plugin	●	●	●	●	●	●	●

[Close](#)

You can reset log levels by clicking the white dot displayed on the current log level.



You can also filter which loggers you see using the **Filter Loggers** text box.

Configure Logging Levels ⓘ	
≡	org
<b>LOGGER</b>	
org	
org.apache	
org.apache.catalina	
org.apache.catalina.core	

## Troubleshoot Spring Boot actuator integration

This section describes how to troubleshoot common issues with the integration of Apps Manager and Spring Boot Actuator.

### /cloudfoundryapplication failed request

#### Symptom

You see the following failed request message in your app logs:

```
Could not find resource for relative : /cloudfoundryapplication of full path:  
http://example.com/cloudfoundryapplication
```

#### Explanation

Apps Manager uses the `/cloudfoundryapplication` endpoint as the root for Spring Boot Actuator integrations. It calls this endpoint for an app when you view the app in the Apps Manager UI, regardless of whether you have configured [Spring Boot Actuator endpoints for Apps Manager](#).

#### Solution

If you are not using the Spring Boot Actuator integrations for Apps Manager, you can ignore this failed request message.

## Configuring multi-foundation support in Apps Manager

Configuring multi-foundation support in Apps Manager allows you to search, view, and manage orgs, spaces, apps, and service instances across multiple foundations from a single interface.

# Configure multi-foundation support

This section explains the procedures for configuring multi-foundation support in Apps Manager.

## Configure TAS for VMs

This section tells you how to configure VMware Tanzu Application Service for VMs (TAS for VMs) on a foundation to enable multi-foundation support in Apps Manager.

To configure multi-foundation support in Apps Manager:

1. In the TAS for VMs tile of one of your foundations, select **Apps Manager**.
2. For **Multi-foundation configuration (beta)**, enter a JSON object for each additional foundation that you want to manage. Use the following format for the JSON object:

```
{
  "FOUNDATION-NAME": {
    "ccUrl": "https://api.FOUNDATION-SYSTEM-DOMAIN.com",
    "systemDomain": "FOUNDATION-SYSTEM-DOMAIN.com",
    "usageServiceUrl": "https://app-usage.FOUNDATION-SYSTEM-DOMAIN.com",
    "invitationsServiceUrl": "https://p-invitations.FOUNDATION-SYSTEM-DOMAIN.co
m",
    "logoutUrl": "https://login.FOUNDATION-SYSTEM-DOMAIN.com/logout.do",
    "metricsUrl": "https://metrics.FOUNDATION-SYSTEM-DOMAIN.com",
    "uaaUrl": "https://login.FOUNDATION-SYSTEM-DOMAIN.com"
  }
}
```

Where:

- **FOUNDATION-NAME** is a name for the foundation.
  - **FOUNDATION-SYSTEM-DOMAIN** is the system domain of the foundation. The system domain is listed in the **Domains** pane of the TAS for VMs tile.
  - **metricsUrl** is an optional field. If App Metrics is installed on the foundation, provide the App Metrics URL.
3. For **Redirect URLs**, enter a comma-separated list of the URLs for each additional foundation on which you activated multi-foundation support. Use the following format for each URL:

```
https://apps.FOUNDATION-SYSTEM-DOMAIN.com/**
```

Where **FOUNDATION-SYSTEM-DOMAIN** is the system domain of the foundation on which you activated multi-foundation support.

## Add trusted certificate authorities

Apps Manager must be able to validate the certificate authorities (CAs) used by all foundations.

If any foundation uses a certificate for TLS termination that is not signed by a globally trusted CA, add the CA that signed the TLS certificate as a trusted CA on the foundation on which you enabled multi-foundation support.

## Configure the SAML identity provider (Optional)

VMware recommends that all foundations use the same external SAML identity provider. This allows Apps Manager to automatically authenticate with the identity provider.

To configure all foundations to use the same SAML identity provider:

1. In the TAS for VMs tile, select **Authentication and Enterprise SSO**.
2. Verify that the foundation uses the correct provider in **Provider name**.
3. Repeat the preceding steps for each foundation in your deployment.

For more information on UAA and identity providers, see [Identity Providers in UAA](#).

For more information on how to set up identity providers in UAA, see [Adding Existing SAML or LDAP Users to an Operations Manager Deployment](#).

## Scaling an app using App Autoscaler

In this section:

- [About App Autoscaler](#)
- [Scaling an app using App Autoscaler](#)
- [Using the App Autoscaler CLI](#)
- [Using the App Autoscaler API](#)
- [Using CPU Entitlement Utilization as a scaling metric](#)
- [Using HTTP latency as a scaling metric](#)
- [Using RabbitMQ Queue Depth as a scaling metric](#)
- [Using custom scaling metrics](#)
- [Tutorial: Scaling a Spring app using a custom scaling metric](#)
- [Scheduled limit changes](#)
- [Using App Autoscaler in production](#)
- [Operating App Autoscaler](#)
- [Using debug logs for App Autoscaler](#)
- [Troubleshooting App Autoscaler](#)

## About App Autoscaler

App Autoscaler with VMware Tanzu Application Service for VMs scales your apps and controls the costs of running them.

## App Autoscaler overview

App Autoscaler is a VMware Tanzu Application Service for VMs (TAS for VMs) Marketplace service that scales apps in your environment based on app performance metrics or a schedule. This controls the cost of running apps while maintaining app performance.

To use App Autoscaler:

- Configure scaling rules that adjust app instance counts based on metrics thresholds
- Edit the maximum and minimum number of instances for an app, either manually or following a schedule
- Configure scaling factors so that the app scales more quickly. Use caution when setting the scaling factors by which to scale your applications up or down.

For example, you might configure App Autoscaler to scale down the number of instances for an app over the weekend. You can configure App Autoscaler to scale up the number of instances for an app when the value of the CPU Usage metric increases above a custom threshold.

## About App Autoscaler scaling rules

This section describes how the App Autoscaler decides when to scale an app up or down.

It also provides information about the Custom App Metrics, Custom App Metric Ratios, and default metrics that you can use when you create scaling rules for an app in App Autoscaler.

### How App Autoscaler decides when to scale

Every 35-seconds, App Autoscaler makes a decision about whether to scale up, scale down, or keep the same number of instances.

To make a scaling decision, App Autoscaler averages the values of a metric for the most recent 120-seconds.

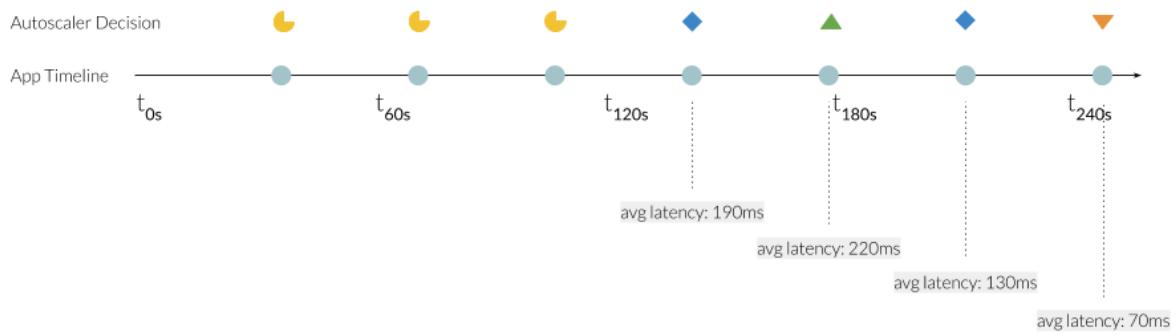
[Configure App Autoscaler](#) in *Configuring TAS for VMs*.

App Autoscaler scales as follows:

- Increments the instances by the app's scale up factor when any metric exceeds its maximum threshold.
- Decrements the instances by the app's scale down factor where the selected metrics fall their minimum thresholds.
- Keeps the same number of instances when app metrics do not exceed thresholds.

The following diagram provides an example of how App Autoscaler makes scaling decisions:

## App Autoscaler - Decision Timing



- SCALING\_INTERVAL = 35s (default)  
(Autoscaler makes a scaling decision)
- METRIC\_COLLECTION\_INTERVAL = 120s (default)  
(window in which metrics are calculated)
- ▲ Scaling decision: Scale Up
- ▼ Scaling decision: Scale Down
- Scaling decision: Defer (not enough data)
- ◆ Scaling decision: Defer (within rule bounds)

### Scaling Manifest for App

```
---
instance_limits:
  min: 1
  max: 2
rules:
  - rule_type: "http_latency"
    rule_sub_type: "avg_99th"
    threshold:
      min: 80
      max: 200
```

As shown in the diagram, an app has a maximum threshold of 200-milliseconds and a minimum threshold of 80-milliseconds for an HTTP Request Latency metric. The scale up factor and scale down factor are not set in the scaling manifest, so the default value is one.

If HTTP Request Latency averages 220-milliseconds for 120-seconds, App Autoscaler scales the app up one instance.

If HTTP Request Latency then averages 70-milliseconds over the next 120-second window and the app's other scaling metrics also fall below their minimum thresholds, App Autoscaler scales the app down one instance.

If the average value for HTTP Request Latency over a 120-second window falls below the maximum threshold of 200-milliseconds or the minimum threshold of 80-milliseconds, App Autoscaler maintains the same number of instances for the app.

You can set a maximum and minimum number of instances. For example, if an app exceeds the maximum threshold of selected metric, but the number of instances is already at the maximum number of instances, App Autoscaler does not scale up the app.

You can set a period of time after a scaling action within which no further scaling action may be taken to prevent scaling decisions for an app with a slow startup time. App Autoscaler refers to this concept as cooldown period. For example, when an app configured with a cooldown period of 5m is scaled by App Autoscaler, App Autoscaler will not consider the app for further scaling decisions until at least five minutes after that scaling event. This helps App Autoscaler avoid overscaling an app while a new instance is still starting up and producing metrics that would otherwise cause further scaling actions.

## Default metrics for scaling rules

App Autoscaler includes several default metrics for which you might create scaling rules.



VMware recommends that you define Custom App Metrics for scaling rules instead of using the default metrics. You can use Custom App Metrics to accurately monitor the performance of your apps based on your environment.

The following table lists the default metrics for App Autoscaler:

Metric	Description	Note
CPU Entitlement Utilization	Average usage of the CPU entitlement for the app, across all instances of the app. This metric is a percentage of the amount of CPU that is always available to each instance of the app.	n/a
CPU Processor Utilization (Deprecated)	Average CPU percentage for all instances of the app.	App CPU utilization data might vary greatly based on the number of CPU cores on Diego Cells and app density. For more information, see <a href="#">Use CPU Entitlement Utilization as a scaling metric with App Autoscaler</a> .
Container Memory Utilization	Average memory percentage across all instances of the app.	n/a
HTTP Request Throughput	Average number of HTTP requests per second across all of the app instances.	n/a
HTTP Request Latency	Average latency of app response to HTTP requests. This does not include Gorouter processing time or other network latency. Average is calculated on the middle 99% or middle 95% of all HTTP requests.	n/a
RabbitMQ Queue Depth	The queue length of the specified RabbitMQ queue.	n/a

## Custom App Metrics for scaling rules

VMware recommends that you define Custom App Metrics for App Autoscaler scaling rules. You can use Custom App Metrics to define the metrics that are the best indicators of app performance for your environment.

You can configure apps to emit Custom App Metrics out of the Loggregator Firehose using Metric Registrar. For steps on how to configure your apps to emit Custom App Metrics with Metric Registrar, see [Registering custom app metrics](#).

## Custom App Metric Ratios

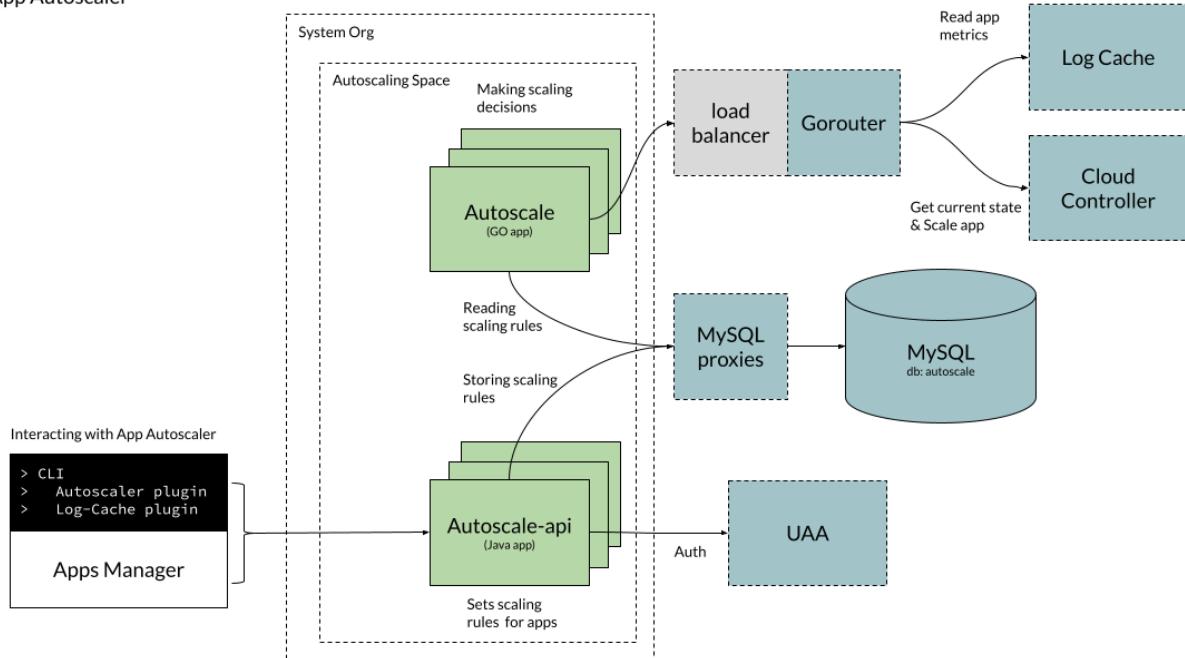
You can use the **Comparison Metric** text box in Apps Manager to define a scaling rule that divides one Custom App Metric by another.

When you add a scaling rule, the **Metric** text box is the dividend and the **Comparison Metric** text box is the divisor.

## App Autoscaler architecture

The following diagram shows the components and architecture of App Autoscaler. It also shows how App Autoscaler components interact with VMware Tanzu Application Service for VMs (TAS for VMs) components to make app scaling decisions.

#### App Autoscaler



[View a larger version of this image.](#)

As demonstrated in the architecture diagram, App Autoscaler makes scaling decisions based on autoscaling rules that users configure by using either the Cloud Foundry Command Line Interface (cf CLI) or Apps Manager. The Autoscale API stores these autoscaling rules in a MySQL database.

At a predefined interval, known as the scaling interval, the App Autoscaler app reads the scaling rules and retrieves app metric data from the Loggregator Log Cache. Then, App Autoscaler makes a scaling decision and communicates with the Cloud Controller to scale the app, if necessary.

For more information about Loggregator Log Cache, see [Loggregator architecture](#).

For more information about the Cloud Controller, see [Cloud Controller](#).

## Scaling an app with App Autoscaler

With the Space Developer role, you can configure the App Autoscaler service in Apps Manager to scale apps in your TAS for VMs deployment.

You can use the App Autoscaler command-line interface (CLI) plug-in to configure App Autoscaler rules from the command line. For more information, see [Using the App Autoscaler CLI](#).

Space Managers, Space Auditors, and all Org roles do not have permission to use App Autoscaler. For help managing user roles, see [Managing user accounts and permissions using Apps Manager](#).

## App Autoscaler overview

To use App Autoscaler to scale your apps in your VMware Tanzu Application Service for VMs (TAS for VMs) deployment, you must create and bind the App Autoscaler service, then configure scaling rules for App

Autoscaler.

For more information about App Autoscaler, including information about how to create scaling rules, see [About App Autoscaler](#).

## Prerequisite

Before using the Autoscaler service in Apps Manager, you must configure the `search-server` app for any deployments that have restrictive networking policies around request proxying.

Autoscaler controls cannot appear for apps in Apps Manager if your TAS for VMs deployment has restrictive networking policies around request proxying.

To resolve this issue and enable Autoscaler controls in Apps Manager:

1. Using the cf CLI, log in to the system org and system space.
2. Locate the `search-server` app.
3. Update the `no_proxy` environment variable for the `search-server` app to include your system domain.

```
cf set-env search-server no_proxy '*.SYSTEM-DOMAIN'
```

where `SYSTEM-DOMAIN` is the system domain configured for your TAS for VMs deployment. For example:

```
cf set-env search-server no_proxy '*.example.com'
```

4. Restage the `search-server` app.

```
cf restage search-server
```

## Configure App Autoscaler

To configure App Autoscaler:

1. Create and bind the App Autoscaler service to your app. See [Create and bind the App Autoscaler service](#).
2. Configure autoscaling instance limits for your app. See [Configure autoscaling for an app](#).

### Create and bind the App Autoscaler service

To use App Autoscaler, you must create an instance of the App Autoscaler service and bind it to any app you want or from the Cloud Foundry Command Line Interface (cf CLI):

- **Apps Manager:**
  1. [Create an instance of the service](#).
  2. [Bind the service to an app](#).
- **cf CLI:**
  1. [Create an instance of the service](#).

## 2. Bind the service to an app.



Manual scaling overrides scaling rules that you configure with App Autoscaler. If you manually scale an app bound to an App Autoscaler service instance, the App Autoscaler instance unbinds from that app, and the app scales to the manual setting. For more information, see [Managing apps and service instances using Apps Manager](#).

To enable App Autoscaler for an app:

1. In Apps Manager, select an app from the space in which you created the App Autoscaler service.
2. Under **Processes and Instances**, click **Autoscaling Deactivated** to manage autoscaling.

Processes and Instances						
web (Revision 1)				AUTOSCALING DEACTIVATED	SCALE	
Instances	2	Memory Allocated	256 MB	Disk Allocated	1 GB	Log Rate Allocated (per second) 16 KB
#	CPU Entitlement	Memory	Disk	Log Rate (per second)	Uptime	
0	3%	15.3 MB	5.17 MB	0 B	1 hr 7 min	x
1	5%	14.9 MB	5.17 MB	0 B	2 min	x

3. Click **Activate Autoscaling** to activate App Autoscaler. You can then configure instance limits, scaling rules, and scheduled limit changes for the app. For more information, see [Configure autoscaling for an app](#).

×

## Manage Autoscaling

---

**DEACTIVATE AUTOSCALING**
[Download Autoscaler CLI](#)

---

### INSTANCE LIMITS AND SCALING

Scale Up By  instance/instances at the same time

Scale Down By  instance/instances at the same time

Currently in use: 2

Minimum 
Maximum

---

### APPLICATION COOLDOWN PERIOD

Time to wait after autoscaling an app before evaluating it for scaling again. Useful for apps that consume substantial resources when starting up, or that require time to stabilize after adding or removing instances. By default the tPCF instance evaluates apps for autoscaling every seconds

seconds before considering app for scaling

APPLY CHANGES

## Configure autoscaling for an app

App Autoscaler keeps instance counts within an allowable range defined by minimum and maximum values. The minimum and maximum values are called instance limits.

For more information about how App Autoscaler makes scaling decisions for an app, see [How App Autoscaler determines when to scale](#) in *About App Autoscaler*.

### Create or change instance limits

This section describes how to create and edit instance limits for app scaling rules. You can also schedule changes to your instance limits for a specific date and time. For more information, see [Scheduled limit changes](#).

To manually edit instance limits:

1. In Apps Manager, navigate to the **Overview** page for your app. Under **Processes and Instances**, click **Autoscaling Activated**.

2. In the **Instance Limits** section, set values for **Minimum** and **Maximum**.

✗ **Manage Autoscaling**

The screenshot shows the 'Manage Autoscaling' page. At the top right is a link to 'Download Autoscaler CLI'. Below it is a button labeled 'DEACTIVATE AUTOSCALING' with a blue border. The main section is titled 'INSTANCE LIMITS AND SCALING'. It contains two sets of input fields: 'Scale Up By' (set to 1) and 'instance/instances at the same time', and 'Scale Down By' (set to 1) and 'instance/instances at the same time'. Below these is a status message 'Currently in use: 2' with a progress bar. At the bottom are 'Minimum' (set to 2) and 'Maximum' (set to 3) input fields, followed by a large blue 'APPLY CHANGES' button.

3. Click **Apply Changes**.

#### Add or delete scaling rules

The following procedures describe how to add and delete scaling rules for your apps with App Autoscaler.

For more information about scaling rules and metrics in App Autoscaler, see [About App Autoscaler scaling rules](#).

To add a scaling rule for an app:

1. In the **Manage Autoscaling** pane, click **Add Rule** next to **Scaling Rules**. The **Add Rule** pane appears.
2. From the **Rule Type** options, select the metric for the new scaling rule.

## < Add Rule

Apps scale by the default or configured scaling factor per event. Apps will scale up when any metric maximum is met and scale down only when all metric minimums are met.

### Rule Type

**Container Memory Utilization**

Average memory percentage across all instances of the app.

**CPU Entitlement Utilization**

Average usage of the app's CPU entitlement across all instances of the app. This metric is a percentage of the amount of CPU that each instance of the app can rely on always being available to it.

**CPU Processor Utilization (Deprecated)**

Average CPU processor utilization across all instances of the app. Deprecated in favor of the CPU Entitlement Utilization rule.

1. Set the minimum and maximum thresholds for the metric. For information about setting instance limits, see [About App Autoscaler scaling rules](#) in *About App Autoscaler*.
2. Select or fill in any other text boxes that appear under the threshold text boxes:
  - If you are adding an **HTTP Request Latency** rule, configure **Percent of traffic to apply**.
  - If you are adding a **RabbitMQ Queue Depth** rule, provide the name of the queue to measure.
  - If you are adding a **Custom App Metric** rule, enter your custom **Metric**.
  - If you are adding a **Custom App Metric Ratio** rule, enter values in the **Metric** and **Comparison Metric** text boxes.
3. Click **Save**.

To delete a scaling rule for an app:

1. In the **Manage Autoscaling** pane, click the trash can icon next to the rule that you want to delete.

### Create or edit scheduled limit changes

Because app demand often follows a weekly, daily, or hourly schedule, you can schedule App Autoscaler to change the allowable instance range to track expected surges or quiet periods.

To create or edit a scheduled limit change:

1. Next to **Scheduled Limits**, click **Edit**.
2. Click **Add New** to add a new scheduled limit, or select an existing entry and click **EDIT** next to the entry.
3. Edit the following values:
  - **Date and Time (local)**: Set the date and time of the change.
  - **Repeat (Optional)**: Set the day of the week for which you want to repeat the change.
  - **Min and Max**: Set the allowable range within which App Autoscaler can change the instance count for an app.
4. Click **Save**.

In time zones that observe Daylight Saving Time, Apps Manager might not account for changes in offset from UTC time when it applies scheduled limit changes. Contact [Tanzu Support](#) if you need help.

To delete an existing entry, click the **x** icon next to the entry that you want to delete.

For example, to schedule an app to scale down for a weekend, you can enter these two rules:

1. Scale down to a single instance on Friday evening:
  - **Date and Time (local)**: Dec, 2, 2018 and 7:00 PM
  - **Repeat (Optional)**: Fr
  - **Min and Max**: 1 and 1
2. Increase instances to between 3 and 5 on Monday morning:
  - **Date and Time (local)**: Dec, 5, 2018 and 7:00 AM
  - **Repeat (Optional)**: M
  - **Min and Max**: 3 and 5

## View and manage App Autoscaler events and notifications

App Autoscaler logs all autoscaling events. You can view event history and manage notifications for App Autoscaler.

### View event history

To view all autoscaling events in the past 24 hours, click **View More** in the **Event History** section of the **Manage Autoscaling** pane.

#### EVENT HISTORY

Most Recent: **Mon June 4, 2018 at 3:12 PM**

Rule Applied: Scaling Limits set to 2 to 5 instances

[VIEW MORE](#)

### Manage App Autoscaler notifications

App Autoscaler emails or texts its event notifications to all users with the Space Developer role by default.

To subscribe or unsubscribe from autoscaling event notifications:

1. Go to the **Manage Notifications** page in Operations Manager. If installed, Notifications Management must be available at <https://notifications-ui.SYSTEM-DOMAIN/preferences>, where **SYSTEM-DOMAIN** is your system domain.
2. Decide which notifications you want to receive from App Autoscaler.

## Manage Notifications

You will receive email notifications from checked items

- Cloud Foundry Autoscaling Service
  - Scaling Down
  - Manual Scaling Detected
  - Maximum Instance Limit Reached
  - Quota Limit Reached
  - Scaling Up

## Using the App Autoscaler CLI

You can use the App Autoscaler Command-Line Interface (CLI) to control scaling apps in your TAS for VMs deployment.

### App Autoscaler CLI overview

The App Autoscaler CLI is an extension of the Cloud Foundry Command-Line Interface (cf CLI). You can configure and control Autoscaler from your local command line to scale apps in your VMware Tanzu Application Service for VMs (TAS for VMs) deployment.



The return output from the App Autoscaler CLI might include odd characters in Windows shells that do not support text color. To prevent this error, run `SET CF_COLOR=false` in your Windows shell pane before you use the App Autoscaler CLI. Some Windows shells do not support the `CF_COLOR` environment variable.

### Install the App Autoscaler CLI plug-in

Before running App Autoscaler CLI commands, you must install the App Autoscaler CLI plug-in.

To install the plug-in:

1. Download the [Tanzu App Autoscaler CLI plug-in](#) from Broadcom Support.



There are two versions of the App Autoscaler CLI. If you install the wrong version, you cannot use it with the Autoscaler instance in your TAS for VMs deployment. For more information, see [App Autoscaler for Cloud Foundry does not work with TAS for VMs](#) in *Troubleshooting App Autoscaler*

2. In a terminal window, run:

```
cf install-plugin LOCATION-OF-PLUGIN
```

Where `LOCATION-OF-PLUGIN` is the path to the binary file you downloaded from Broadcom Support. For example:

```
cf install-plugin ~/Downloads/autoscaler-for-pcf-clipugin-macosx64-binary-2.0.91
```

For more information about installing cf CLI plug-ins, see [Install a plug-in](#) in *Using cf CLI plug-ins*.

## Create and bind an Autoscaler service instance

Before you can use Autoscaler, you must create a service instance of Autoscaler and bind it to your app. For more information about service instances, see [Managing service instances with the cf CLI](#).

To create and bind an Autoscaler service instance:

1. In a terminal window, target the space in which the app you want to scale by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- `ORG-NAME` is the name of the org containing the space in which the app you want to scale is deployed.
- `SPACE-NAME` is the name of the space in which the app you want to scale is deployed.

2. Create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-NAME
```

Where:

- `PLAN-NAME` is the name of the service plan you want to use for the Autoscaler service instance.
- `SERVICE-INSTANCE-NAME` is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

3. Bind the Autoscaler service instance you created to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- `APP-NAME` is the name of the app you want to scale.

- `SERVICE-INSTANCE-NAME` is the name of the Autoscaler service instance in the previous step.

Only one service instance of Autoscaler can exist in each space in an org. If you try to create more than one Autoscaler service instance in a space, the App Autoscaler CLI returns an error message. For more information, see [One Autoscaler service instance per space](#) in *Troubleshooting App Autoscaler*.

## View apps bound to Autoscaler

You can view a list of all the apps that are bound to an Autoscaler service instance in a space.

1. In a terminal window, target the space in which you want to view apps bound to an Autoscaler service instance by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- `ORG-NAME` is the name of the org containing the space in which the apps you want to view are deployed.
- `SPACE-NAME` is the name of the space in which the apps you want to view are deployed.

2. Run:

```
cf autoscaling-apps
```

This command returns a list of apps that are bound to Autoscaler, whether autoscaling is configured for those apps, and the autoscaling limits and scaling factors that are configured for them:

Presenting autoscaler apps in org example-org / space example-space as user					
Name	Min Instances	Max Instances	Scale Up Factor	Scale Down Factor	Enabled
example-app	1	4	d0077dc5-34bd-42c7-b377-e0fcb14d67f3	1	true
m30s					
example-app-2	10	40	3f8c6e84-0b6e-4ec9-9335-0aad3979d672	2	false
0s					
OK					

## Allow autoscaling

1. To set Autoscale for your app, run:

```
cf enable-autoscaling APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to allow autoscaling.

To enable scaling of `example-app`, for example, run:

```
cf enable-autoscaling example-app
```

The output looks similar to this:

```
Enabled autoscaling for app example-app for org example-org / space example-space as user
OK
```

By default, the upper and lower autoscaling limits for an app are `-1`. Before Autoscaler can scale an app, you must update these upper and lower autoscaling limits. For more information, see [Configure autoscaling limits](#).

## Disallow autoscaling

To disallow autoscaling for an app:

1. Run:

```
cf disable-autoscaling APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to disallow autoscaling.

To stop Autoscaler from scaling `example-app`, for example, run:

```
cf disable-autoscaling example-app
```

The output looks similar to this:

```
Deactivated autoscaling for app example-app for org example-org / space example-space as user
OK
```

## Configure autoscaling limits

To configure the upper and lower autoscaling limits for an app:

1. In a terminal window, run:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- `APP-NAME` is the name of the app for which you want to configure autoscaling limits.
- `LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app.
- `UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app.

For example, if you run the following command, it sets the lower scaling limit for `example-app` to `20` and the upper scaling limit to `100`:

```
cf update-autoscaling-limits example-app 20 100
```

The output looks similar to this:

```
Updated autoscaling instance limits for app example-app for org example-  
-org / space example-space as user  
OK
```

For more information about autoscaling limits, see [Autoscaling limits](#) in *Using App Autoscaler in production*.

## Configure scaling factors

To configure scaling factors for an app:

1. In a terminal window, run:

```
cf update-autoscaling-factors APP-NAME SCALE-UP-FACTOR SCALE-DOWN-FACTOR
```

Where:

- **APP-NAME** is the name of the app for which you want to configure scaling factors.
- **SCALE-UP-FACTOR** is the number of app instances by which you want Autoscaler to scale up at a time.
- **SCALE-DOWN-FACTOR** is the number of app instances by which you want Autoscaler to scale down at a time.

For example, if you run the following command, it configures Autoscaler to scale `example-app` up by 20 instances at a time and down by 10 instances at a time:

```
cf update-autoscaling-factors example-app 20 10
```

The output looks similar to this:

```
Updated autoscaling factors for app hello-app in org example-org / space example-space as user  
OK
```

For more information about scaling factors, see [Scaling factors](#) in *Using App Autoscaler in production*.

## Configure cooldown period

Apps may benefit from a cooldown period after scaling, during which no further automatic scaling occurs. This cooldown period only applies to actions performed by App Autoscaler, not to manual scaling via `cf push` or `cf scale` commands. By default, apps have no cooldown period, so the CLI command `cf autoscaling-apps` will show a value of `0s`.

Consider an app configured with a cooldown period of `60s` and the default 35-second scaling interval. If App Autoscaler scales the app up, the next potential scaling decision (35 seconds later) is skipped because the cooldown period hasn't elapsed. However, at the second interval (70 seconds after the initial scale-up), App Autoscaler reevaluates scaling since the cooldown period has ended.

In addition to the relationship between the startup time for an app and its configured cooldown period, also consider the metric interval for the app. Because the metric interval looks into the past from the time of a scaling interval, it may consider the metrics for an app still starting up in the first scaling interval after a cooldown period. Consider setting cooldown period in accordance with the metric interval to ensure an app with a long startup time does not trigger a false scaling decision based on metrics for an app that was still starting up.

To configure the cooldown period for an app:

1. In a terminal window, run:

```
cf update-autoscaling-cooldown APP-NAME COOLDOWN-PERIOD
```

Where:

- `APP-NAME` is the name of the app for which you want to configure scaling factors.
- `COOLDOWN-PERIOD` is the time duration (`45s`, `3m`, `25m30s`) to wait after scaling, during which no further automatic scaling occurs.

For example, the following command configures App Autoscaler to only consider `example-app` for further scaling at least two minutes after an autoscaling action is performed:

```
cf update-autoscaling-cooldown example-app 2m
```

The output looks similar to this:

```
Updated cooldown period for app example-app in org example-org / space
example-space as admin
OK
```

## Autoscaling rules and scaling metrics

Using the procedures in this section, you can configure autoscaling rules for Autoscaler to use when making scaling decisions for an app.

See also:

- For information about scaling metrics for which you can configure autoscaling rules, see [Scaling metrics](#) in *Using App Autoscaler in Production*.
- For information about the scaling metrics you can use when defining autoscaling rules for Autoscaler, see [Default metrics for scaling rules](#) and [Custom App Metrics for scaling rules](#) in *About App Autoscaler*.

## View all autoscaling rules

To view all autoscaling rules that are configured for an app:

1. Run:

```
cf autoscaling-rules APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to view all autoscaling rules.

To return a list of all autoscaling rules that are configured for `example-app`, for example, run:

```
cf autoscaling-rules example-app
```

The output looks similar to this:

Presenting autoscaler rules for app example-app for org example-org / space example-space as user					
Guid	Type	Metric	Sub T		
ype	Service Instance	Min Threshold	Max Threshold		
45870b7f-f5c9-403f-9150-e79314f62f06	cpu				
10	20				
10a581c5-8fb4-48a2-b4de-8bc834aac146	http_throughput				
20	30				
OK					

## Create an autoscaling rule

To create a new autoscaling rule for an app:

- Run:

```
cf create-autoscaling-rule APP-NAME RULE-TYPE MINIMUM-THRESHOLD MAXIMUM-THRESHOLD --subtype SUBTYPE --metric METRIC-NAME --comparison-metric COMPARISON-METRIC-NAME --rabbitmq-instance SERVICE-INSTANCE-NAME
```

Where:

- `APP-NAME` is the name of the app for which you want to create an autoscaling rule.
- `RULE-TYPE` is the rule type of the autoscaling rule that you want to create. Valid values are `compare`, `cpu`, `cpu_entitlement`, `custom`, `http_latency`, `http_throughput`, `memory`, or `rabbitmq`.



- `http_latency` threshold units are in milliseconds. In general, VMware recommends that you configure the value for `MAXIMUM-THRESHOLD` to be at least twice the value for `MINIMUM-THRESHOLD`, to avoid excessive cycling. HTTP Request Latency is calculated from the Gorouter to the app and back to the Gorouter. HTTP Request Latency is not calculated between the user and the app.
- If you specify `http_latency` as the rule type, you must also specify a rule subtype using the `--subtype` or `-s` parameter.
- The `cpu` rule type is deprecated in favor of the `cpu_entitlement` rule type.
- If you specify `compare` as the rule type, you must also specify a scaling metric using the `--metric` or `-m` parameter and a

comparison metric using the `--comparison-metric` or `-c` parameter.

- If you specify `custom` as the rule type, you must also specify a scaling metric using the `--metric` or `-m` parameter.

- `MINIMUM-THRESHOLD` is the minimum threshold for the scaling metric.
- `MAXIMUM-THRESHOLD` is the maximum threshold for the scaling metric.
- (Optional) Include the `--subtype` or `-s` parameter to specify a rule subtype, where `SUBTYPE` is the rule subtype you want to specify. For an `http_latency` rule, valid values are `avg_99th` or `avg_95th`. For a `rabbitmq` rule, a valid value is the name of the RabbitMQ queue you want Autoscaler to monitor. This queue must be on a RabbitMQ service instance that is bound to the app you want to scale.
- (Optional) Include the `--metric` or `-m` parameter to specify a scaling metric for a `compare` or `custom` rule, where `METRIC-NAME` is the name of the scaling metric.
- (Optional) Include the `--comparison-metric` or `-c` parameter to specify a comparison metric for a `compare` rule, where `COMPARISON-METRIC-NAME` is the name of the metric you want to compare to the scaling metric.
- (Optional) Include the `--rabbitmq-instance` or `-r` parameter to specify a RabbitMQ service instance for a `rabbitmq` rule, where `SERVICE-INSTANCE-NAME` is the name of the RabbitMQ service instance you want Autoscaler to query. Defining this parameter ensures that Autoscaler does not unnecessarily query other RabbitMQ service instances that are bound to the app.

See also:

- For information about configuring Autoscaler to use HTTP Request Latency as the scaling metric for an app, see [Using HTTP Request Latency as a scaling metric](#).
- For information about configuring Autoscaler to use RabbitMQ queue depth as the scaling metric for an app, see [Using RabbitMQ queue depth as a scaling metric](#).
- For information about configuring Autoscaler to use CPU Entitlement Usage as the scaling metric for an app, see [Using CPU Entitlement Utilization as a scaling metric](#).
- For information about configuring Autoscaler to use a custom scaling metric as the scaling metric for an app, see [Using custom scaling metrics](#).

## Delete an autoscaling rule

To delete an autoscaling rule for an app:

1. To view all autoscaling rules for the app for which you want to delete an autoscaling rule, follow the procedure in [View all autoscaling rules](#).
2. From the `Guid` column of the terminal output, record the global unique identifier (GUID) of the autoscaling rule you want to delete.
3. Run:

```
cf delete-autoscaling-rule APP-NAME RULE-GUID
```

Where:

- **APP-NAME** is the name of the app for which you want to delete an autoscaling rule.
- **RULE-GUID** is the GUID of the autoscaling rule you want to delete.

To delete the autoscaling rule with a GUID of `10a581c5-8fb4-48a2-b4de-8bc834aac146` for `example-app`, run:

```
cf delete-autoscaling-rule example-app 10a581c5-8fb4-48a2-b4de-8bc834aac146
```

4. When prompted, enter `y` to delete the autoscaling rule.

## Delete all autoscaling rules

To delete all autoscaling rules for an app:

1. Run:

```
cf delete-autoscaling-rules APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to delete all autoscaling rules.

To delete all autoscaling rules for `example-app`, run:

```
cf delete-autoscaling-rules example-app
```

2. When prompted, enter `y` to delete all autoscaling rules for the app.

## View autoscaling events

To view a list of autoscaling events that Autoscaler has recorded for an app:

1. Run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of your app.

To return a list of all recent autoscaling events that Autoscaler has recorded for `example-app`, run:

```
cf autoscaling-events example-app
```

The output looks similar to this:

Time	Description
2032-01-01T00:00:00Z	Scaled up from 3 to 4 instances. Current cpu of 20 is above upper threshold of 10.

## Scheduled limit changes

For procedures, see the sections below.

## View all scheduled limit changes

To view all scheduled limit changes for an app:

- Run:

```
cf autoscaling-slcs APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to view all scheduled limit changes.

To return a list of all scheduled limit changes configured for `example-app`, for example, run:

```
cf autoscaling-slcs example-app
```

The output looks similar to this:

Guid	Instances	Max Instances	Recurrence	First Execution	Min In
f08f9803-6e5d-4519-abc3fea640300d01	1		Mo,Tu,We,Th,Fr	2018-06-12T22:00:00Z	0

## Create a scheduled limit change

To create a scheduled limit change for an app:

- Run:

```
cf create-autoscaling-slc APP-NAME TIME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
--recurrence DAY-1,DAY-2,DAY-3
```

Where:

- `APP-NAME` is the name of the app.
  - `TIME` is the time, in UTC timestamp format, at which you want Autoscaler to apply the scheduled limit change. For example, `2032-01-01T20:00:00Z`.
  - You can only configure times for scheduled limit changes in UTC time.
  - If the value that you configure for `TIME` is your local time converted to UTC time, and Daylight Saving Time is observed in your time zone, the UTC offset for your time zone might change during the year.
- `LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is fewer than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances up to this number.
  - `UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is greater than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances down to this number.

- (Optional) Include the `--recurrence` parameter to specify the days of the week on which you want Autoscaler to re-apply the scheduled limit change, where `DAY-1`, `DAY-2`, `DAY-3`, and so on are the days you want to specify. Valid values are `Mo`, `Tu`, `We`, `Th`, `Fr`, `Sa`, or `Su`. For example, if you want Autoscaler to re-apply the scheduled limit change on Monday, Wednesday, Friday, and Saturday, include `--recurrence Mo,We,Fr,Sa` in the preceding command.

To configure Autoscaler to create a minimum of one instance and a maximum of two instances of `example-app` for the first time at 2018-06-14T15:00:00Z UTC and the same time every Saturday afterward, for example, run:

```
cf create-autoscaling-slc example-app 2018-06-14T15:00:00Z 1 2 --recurrence Sa
```

The output looks similar to this:

```
Created scheduled autoscaler instance limit change for app example-app in org example-org / space example-space as user
OK
Guid                                         First Execution      Min Ins
Instances   Maximum Instances   Recurrence
7a19a8a2-e435-4c67-b038-cc4add8be686       2018-06-14T15:00:00Z   1
2                                              Sa
```

## Delete a scheduled limit change

To delete a scheduled limit change for an app:

- To view all scheduled limit changes for the app for which you want to delete a scheduled limit change, follow the procedure in [View all scheduled limit changes](#).
- From the `Guid` column of the terminal output, record the GUID of the scheduled limit change you want to delete.
- Run:

```
cf delete-autoscaling-slc APP-NAME SLC-GUID [--force]
```

Where:

- `APP-NAME` is the name of the app for which you want to delete a scheduled limit change.
- `SLC-GUID` is the GUID of the scheduled instance limit change that you recorded in the previous step.

To delete the scheduled limit change with a GUID of `d0077dc5-34bd-42c7-b377-e0fc14d67f3` for `example-app`, for example, run:

```
cf delete-autoscaling-slc example-app d0077dc5-34bd-42c7-b377-e0fc14d67f3
```

- When prompted, enter `y` to delete the scheduled limit change.

## Configure Autoscaler by using a manifest file

You can configure autoscaling rules, scaling limits, and scheduled limit changes for Autoscaler declaratively through a manifest file. This manifest file only configures Autoscaler, and does not interfere with any other existing app manifest files in your TAS for VMs deployment.

To configure Autoscaler using a manifest file:

1. Create a YAML file that includes the following configuration parameters:

```
---
instance_limits:
  min: LOWER-SCALING-LIMIT
  max: UPPER-SCALING-LIMIT
rules:
- rule_type: RULE-TYPE
  threshold:
    min: MINIMUM-METRIC-THRESHOLD
    max: MAXIMUM-METRIC-THRESHOLD
  cooldown_period: COOLDOWN-PERIOD
  scheduled_limit_changes:
- recurrence: RECURRENT
  executes_at: "TIME"
  instance_limits:
    min: SCHEDULED-LOWER-SCALING-LIMIT
    max: SCHEDULED-UPPER-SCALING-LIMIT
  scaling_factors:
    up: SCALE-UP-FACTOR
    down: SCALE-DOWN-FACTOR
```

Where:

- `instance_limits`
  - `LOWER-SCALING-LIMIT` is the minimum number of instances that you want Autoscaler to create for the app by default.
  - `UPPER-SCALING-LIMIT` is the maximum number of instances that you want Autoscaler to create for the app by default.
- `rules` (Optional)
  - If you do not want to configure autoscaling rules for an app, omit the block or include an empty one: `rules: []`. Any pre-existing rules will be deleted when applying the manifest.
  - `RULE-TYPE` is the type of autoscaling rule you want Autoscaler to use for autoscaling decisions. For more information about configuring autoscaling rules using a manifest file, see [Using HTTP Request Latency as a scaling metric](#), [Using RabbitMQ queue depth as a scaling metric](#), and [Using custom scaling metrics](#).
  - `MINIMUM-METRIC-THRESHOLD` is the minimum scaling metric threshold. If the average value of the scaling metric falls below this number, Autoscaler scales the number of app instances down.
  - `MAXIMUM-METRIC-THRESHOLD` is the maximum custom scaling metric threshold. If the average custom scaling metric rises above this number, Autoscaler scales the number of app instances up.
- `cooldown_period` (Optional)

- If you do not want to configure a cooldown period for an app, omit the block. Any pre-existing cooldown period will be reset to `0s` when applying the manifest.
- `COOLDOWN-PERIOD` is the time duration (`45s`, `3m`, `25m30s`) to wait after scaling, during which no further automatic scaling occurs.
- `scheduled_limit_changes` (Optional)
  - If you do not want to configure scheduled limit changes for an app, omit the block or include an empty one: `scheduled_limit_changes: []`. Any pre-existing scheduled limit changes will be deleted when applying the manifest.
  - `RECURRENCE` is the calculated value of the bitmasked days of the week on which you want Autoscaler to re-apply the scheduled limit change. For more information, see [Calculating a recurrence schedule value in Scheduled limit changes](#).
  - `TIME` is the time, in UTC timestamp format, at which you want Autoscaler to apply the scheduled limit change. For example, `2032-01-01T20:00:00Z`. If the value that you configure for `TIME` is your local time converted to UTC time, and Daylight Saving Time is observed in your time zone, the UTC offset for your time zone might change during the year.
  - `SCHEDULED-LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is fewer than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances up to this number.
  - `SCHEDULED-UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is greater than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances down to this number.
- `scaling_factors` (Optional)
  - If you do not want to configure scaling factors for an app, omit the block or include an empty one: `scaling_factors: {}`. Any pre-existing scaling factors will be reset to the default values of `1` and `1` when applying the manifest.
  - `SCALE-UP-FACTOR` is the number of app instances by which you want Autoscaler to scale up at a time.
  - `SCALE-DOWN-FACTOR` is the number of app instances by which you want Autoscaler to scale down at a time.

2. Apply the manifest file you configured in the previous step to the app you want to scale by running:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- `APP-NAME` is the name of the app.
- `MANIFEST-FILENAME` is the filename of the manifest file you created in the previous step.

To apply the `autoscaler.yml` manifest file to `example-app`, run:

```
cf configure-autoscaling example-app autoscaler-manifest.yml
```

The output looks similar to this:

```
Setting autoscaler settings for app example-app for org example-org / space example-space as user
OK
```

## Using the App Autoscaler API

You can use the App Autoscaler API as an interface to App Autoscaler to configure and control scaling apps in your TAS for VMs deployment.

You can use the App Autoscaler Cloud Foundry command-line interface (cf CLI) plug-in, which offers the same features as the App Autoscaler API. See [Using the App Autoscaler CLI](#).

## API endpoints

The API is exposed by the `autoscale-api` app that runs next to the `autoscale` app in the autoscaling space of the system org. This is the base URL of all the requests covered in the following sections.

If your system domain is `system-domain.com`, in most cases you can reach the `autoscale` app at `autoscale.sys.system-domain.com` and the API at `autoscale.sys.system-domain.com/api/v2`.

Confirm that you can reach both the app and the API before you proceed.

## Authentication

You must pass an access token to each API endpoint. The access token is expected as-is on the `Authorization` header of each request.

When you are logged in to your foundation with the cf CLI, get an access token by running `cf oauth-token`.



The App Autoscaler API often returns a 404 error when a token is incorrect. If you are receiving a lot of 404 errors, verify your access token.

## Content type header

To make any PUT or POST requests, you must set the `Content-Type` header to `application/json`. If you do not set this, you might see the following error:

```
"Your token is invalid or the autoscaled application does not exist"
```

This error can appear regardless of the token you use.

## Pagination

Most list calls use pagination. The App Autoscaler API uses a standard form of pagination that is very similar to how the Cloud Foundry API (CAPI) uses pagination.

The following example shows a paginated response from the App Autoscaler API:

```
{
  "pagination": {
    "total_results": 1,
    "total_pages": 1,
    "last": {
      "href": "https://autoscale.sys.example.com/api/v2/apps?space_guid=676e592a-a4e8-43d9-8128-f583c0b45db8&page=1"
    },
    "next": null,
    "first": {
      "href": "https://autoscale.sys.example.com/api/v2/apps?space_guid=676e592a-a4e8-43d9-8128-f583c0b45db8&page=1"
    },
    "previous": null
  },
  "resources": [
    ...list of objects...
  ]
}
```

## Information

`GET /api/v2/info`

### Parameters

None

### Returns

A string denoting the App Autoscaler API version.

## App bindings

This section lists operations for app bindings.

Apps that are bound to App Autoscaler are represented by the App Autoscaler API as apps.

### App binding object

Name	Type	Description
created_at	string	The timestamp for when this object was created
cooldown_period_in_second_s	int	The amount of seconds to wait after scaling before considering for subsequent scaling
enabled	Boolean	Activates or deactivates scaling by App Autoscaler for this app
guid	string	The app GUID from CAPI

Name	Type	Description
instance_limits.max	integer	The maximum instance count that this app is approved
instance_limits.min	integer	The minimum instance count that this app is approved
scaling_factors.up	integer	The number of instances to increment by when scaling up
scaling_factors.down	integer	The number of instances to decrement by when scaling down
updated_at	string	The timestamp for when this object was last updated

## Get all app bindings in a space

```
GET /api/v2/apps
```

### Parameters

Parameter	In	Type	Required	Description
space_guid	query	string	true	The GUID of the space from which you want to get all app bindings
page	query	integer	false	The page of events to get

### Returns

A paginated list of app bindings.

## Get an app binding

```
GET /api/v2/apps/:app_guid
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to get the binding for

### Returns

An app binding.

## Update an app binding

```
PUT /api/v2/apps/:app_guid
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to update the binding for
cooldown_period_in_seconds	body	int	false	The amount of seconds to wait after scaling before considering for subsequent scaling

Parameter	In	Type	Required	Description
enabled	body	Boolean	false	Activates or deactivates scaling by App Autoscaler for this app
instance_limits.max	body	integer	false	The maximum instance count that this app is approved
instance_limits.min	body	integer	false	The minimum instance count that this app is approved
scaling_factors.up		integer		The number of instances to increment by when scaling up
scaling_factors.down		integer		The number of instances to decrement by when scaling down

## Returns

An app binding.

## Events

This section lists operations to retrieve events.

Scaling events include all scaling decisions made by App Autoscaler and other relevant changes. For example, an app is activated or deactivated.

### Event object

Name	Type	Description
created_at	string	The timestamp for when this object was created
description	string	A description of the event
scaling_factor	integer	The change in number of instances
updated_at	string	The timestamp for when this object was last updated

## Get all events for an app

```
GET /api/v2/apps/:app_guid/events
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to retrieve events for
page	query	integer	false	The page of events to get

### Returns

A paginated list of events.

## Rules

This section lists operations for rules.

Rules are tied to individual apps, and no one app can have multiple rules of the same category.

## Rule object

Name	Type	Description
created_at	string	The timestamp for when this object was created
comparison_metric	string	The divisor to compare metrics against
guid	string	The GUID for this particular object
metric	string	The metric on which scaling decisions are made
queue_name	string	The name of the queue to monitor for RabbitMQ rules
rabbitmq_service_instance_guid	string	The GUID of the RabbitMQ service instance
rule_type	string	The type of rule
rule_sub_type	string	The subtype of rule
threshold.max	float	The threshold beyond which the app is scaled up
threshold.min	float	The threshold below which the app is scaled down
updated_at	string	The timestamp for when this object was last updated

## Get all rules for an app

```
GET /api/v2/apps/:app_guid/rules
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to retrieve rules for
page	query	integer	false	The page of events to get

### Returns

A paginated list of rules.

## Create a rule

```
POST /api/v2/apps/:app_guid/rules
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to create a rule for
comparison_metric	body	string	false	The divisor to compare metrics against
metric	body	string	false	The metric on which scaling decisions are made

Parameter	In	Type	Required	Description
queue_name	body	string	false	The name of the queue to monitor for RabbitMQ rules
rabbitmq_service_instance_guid	string	The GUID of the RabbitMQ service instance		
rule_type	body	string	true	The type of rule
rule_sub_type	body	string	false	The subtype of rule
threshold.max	body	float	true	The threshold beyond which the app is scaled up
threshold.min	body	float	true	The threshold below which the app is scaled down

## Returns

A rule.

## Replace all rules

```
PUT /api/v2/apps/:app_guid/rules
```

## Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to set rules for
array of rules	body	array	true	An array of rule objects. See <a href="#">Create a rule</a> .

## Returns

A paginated list of rules.

## Delete all rules

```
DELETE /api/v2/apps/:app_guid/rules
```

## Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to delete rules for

## Returns

A 204 status code and empty body indicating that all rules were deleted.

## Get a rule

```
GET /api/v2/apps/:app_guid/rules/:guid
```

## Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to get a rule for
guid	path	string	true	The GUID of the rule to get

## Returns

A rule.

## Delete a rule

```
DELETE /api/v2/apps/:app_guid/rules/:rule_guid
```

## Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to delete a rule for
rule_guid	path	string	true	The GUID of the rule to delete

## Returns

A 204 status code and empty body indicating that the rule was deleted.

## Scheduled limit changes

This section lists operations for scheduled limit changes (SLCs).

SLCs are jobs scheduled for the future that alter app status, such as enabling, disabling, or instance limits.

## Scheduled limit change object

Name	Type	Description
created_at	string	The timestamp for when this object was created
enabled	Boolean	Whether or not the app is activated or deactivated
executes_at	string	The UTC timestamp indicating when this SLC is first executed
guid	string	The GUID of this object
instance_limits.max	integer	The maximum instance count that is set on the app
instance_limits.min	integer	The minimum instance count that is set on the app
recurrence	integer	A number that represents the days of the week that the change executes. Each bit in the number represents a day in the following order: sun, mon, tue, wed, thur, fri, sat. For example, repeat mon, wed, fri = 0101010 = 42.
updated_at	string	The timestamp for when this object was last updated

## Get All scheduled limit changes for an app

```
GET /api/v2/apps/:app_guid/scheduled_limit_changes
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to retrieve SLCs for
page	query	integer	false	The page of SLCs to get

### Returns

A paginated list of SLCs.

## Create a scheduled limit change

```
POST /api/v2/apps/:app_guid/scheduled_limit_changes
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to create an SLC for
enabled	body	Boolean	true	Whether or not the app is activated or deactivated
executes_at	body	string	true	The UTC timestamp indicating when this SLC is first executed
instance_limit_s.max	body	integer	true	The maximum instance count that is set on the app
instance_limit_s.min	body	integer	true	The minimum instance count that is set on the app
recurrence	body	string	true	A number that represents the days of the week that the change executes. Each bit in the number represents a day in the following order: sun, mon, tue, wed, thur, fri, sat. For example, repeat mon, wed, fri = 0101010 = 42.

### Returns

An SLC.

## Replace all scheduled limit changes for an app

```
PUT /api/v2/apps/:app_guid/scheduled_limit_changes
```

### Parameters

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to replace SLCs for
array of SLCs	body	array	true	An array of SLC objects. See <a href="#">Create a scheduled limit change</a> .

**Returns**

A paginated list of SLCs.

**Delete all scheduled limit changes for an app**

```
DELETE /api/v2/apps/:app_guid/scheduled_limit_changes
```

**Parameters**

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to replace SLCs for

**Returns**

A 204 status code and empty body indicating that the SLCs were deleted.

**Get a scheduled limit change**

```
GET /api/v2/apps/:app_guid/scheduled_limit_changes/:guid
```

**Parameters**

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to get SLCs for
guid	path	string	true	The GUID of the SLC to retrieve

**Returns**

An SLC object.

**Delete a scheduled limit change**

```
DELETE /api/v2/apps/:app_guid/scheduled_limit_changes/:guid
```

**Parameters**

Parameter	In	Type	Required	Description
app_guid	path	string	true	The GUID of the app to delete SLCs for
GUID	path	string	true	The GUID of the SLC to delete

**Returns**

A 204 status code and empty body indicating that the SLC was deleted.

**Using CPU Entitlement Utilization as a scaling metric**

You can configure App Autoscaler to use the CPU Entitlement Utilization metric to scale apps in your VMware Tanzu Application Service for VMs deployment.

Every app running on TAS for VMs is given a CPU Entitlement: the share of the CPU to which the app is entitled, relative to the other apps running on the platform. The CPU Entitlement is calculated based on the amount of memory configured for the app. For example, an app with a 2G memory limit has double the CPU Entitlement of an app with a 1G memory limit.

You can configure App Autoscaler to scale out additional instances of your app when the CPU Entitlement utilization of the app crosses a threshold. This can be useful for CPU-intensive apps.

You also might want to use CPU Entitlement Utilization as a scaling metric when other metrics are not applicable. For example, if your app depends on a backend service that can become slow, then you may not be able to usefully scale the app based on HTTP Request Latency.



The CPU Entitlement Utilization metric replaces the deprecated CPU scaling rule type. VMware recommends that you perform the following steps:

- Replace the older CPU scaling metric with the CPU Entitlement Utilization scaling metric
- When migrating autoscaling rules from the old CPU scaling metric to the CPU Entitlement Utilization metric, review the thresholds to ensure expected behavior

You can configure Autoscaler to use CPU Entitlement Utilization as the scaling metric for an app:

- Through the Cloud Foundry Command-Line Interface (cf CLI). For more information, see [Configuring CPU Entitlement Utilization as the scaling metric for an app through the cf CLI](#).
- Through Apps Manager. For more information, see [Configure CPU Entitlement Utilization as the scaling metric for an app through Apps Manager](#).

To monitor when Autoscaler scales an app based on changes in CPU Entitlement Utilization, see [Reviewing autoscaling events for changes in CPU Entitlement Utilization](#).

For information about use cases that might complicate or prevent you from configuring CPU Entitlement Utilization as the scaling metric for an app, see [Special considerations for using CPU Entitlement Utilization as a scaling metric](#).

VMware recommends that you load-test your app to verify that the autoscaling rules you configured are effective. For more information, see [Load-testing your app](#) in *Using Autoscaler in Production*.

## Configure CPU Entitlement Utilization as the scaling metric for an app through the cf CLI

The procedures in this section describe how to configure Autoscaler to use CPU Entitlement Utilization as the scaling metric for an app through the cf CLI.

You can configure Autoscaler to use CPU Entitlement Utilization as the scaling metric for an app in the following ways:

- Using a manifest file. For more information, see [Configure an autoscaling rule using a manifest file](#).
- Using CLI commands. For more information, see [Configure an autoscaling rule using CLI commands](#).

For the procedures in this section, you must use the App Autoscaler CLI plug-in. To download and install the App Autoscaler CLI plug-in, see [Install the App Autoscaler CLI plug-in](#) in *Using the App Autoscaler CLI*.

## Configure an autoscaling rule by using a manifest file

You can configure autoscaling rules declaratively through a manifest file. This manifest file only configures Autoscaler, and does not interfere with any other existing app manifest files in your TAS for VMs deployment.

To configure an autoscaling rule that defines CPU Entitlement Utilization as its scaling metric using a manifest file:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- `ORG-NAME` is the name of the org containing the space in which the app you want to scale is deployed.
- `SPACE-NAME` is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have an Autoscaler service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-NAME
```

Where:

- `PLAN-NAME` is the name of the service plan you want to use for the Autoscaler service instance.
- `SERVICE-INSTANCE-NAME` is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- `APP-NAME` is the name of the app you want to scale.
- `SERVICE-INSTANCE-NAME` is the name of the Autoscaler service instance in the previous step.

4. To create a manifest file for Autoscaler that configures an autoscaling rule with CPU Entitlement Utilization as its scaling metric, create a YAML file that includes the following configuration parameters:

```

---
instance_limits:
  min: LOWER-SCALING-LIMIT
  max: UPPER-SCALING-LIMIT
rules:
- rule_type: cpu_entitlement
  threshold:
    min: MINIMUM-CPU-PERCENT-THRESHOLD
    max: MAXIMUM-CPU-PERCENT-THRESHOLD
scheduled_limit_changes: []

```

Where:

- `LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app.
- `UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app.
- `MINIMUM-CPU-PERCENT-THRESHOLD` is the minimum CPU Entitlement Utilization threshold as a percentage. If the average CPU Entitlement Utilization falls below this number, Autoscaler scales the number of app instances down. VMware recommends 30% as a default minimum threshold value.
- `MAXIMUM-CPU-PERCENT-THRESHOLD` is the maximum CPU Entitlement Utilization threshold as a percentage. If the average CPU Entitlement Utilization rises above this number, Autoscaler scales the number of app instances up. VMware recommends 80% as a default maximum threshold value.

The following example shows an Autoscaler manifest file with a minimum CPU Entitlement Utilization threshold of 30% and a maximum CPU Entitlement Utilization threshold of 80%:

```

---
instance_limits:
  min: 10
  max: 100
rules:
- rule_type: cpu_entitlement
  threshold:
    min: 30
    max: 80
scheduled_limit_changes: []

```

5. Apply the autoscaling rule you configured in the previous step to the app you want to scale by running:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- `APP-NAME` is the name of the app.
- `MANIFEST-FILENAME` is the filename of the manifest file you created in the previous step. For example, `autoscaler.yaml`.

## Configure an autoscaling rule by using CLI commands

To configure an autoscaling rule that defines CPU Entitlement Utilization as its scaling metric using CLI commands:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- **ORG-NAME** is the name of the org containing the space in which the app you want to scale is deployed.
- **SPACE-NAME** is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have a service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-INSTANCE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
- **SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance in the previous step.

4. Configure upper and lower scaling limits for the app by running:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- **APP-NAME** is the name of the app.
- **LOWER-SCALING-LIMIT** is the minimum number of instances you want Autoscaler to create for the app.
- **UPPER-SCALING-LIMIT** is the maximum number of instances you want Autoscaler to create for the app.

5. Enable Autoscaler to begin making scaling decisions for the app by running:

```
cf enable-autoscaling APP-NAME
```

Where `APP-NAME` is the name of the app.

6. Create a `cpu_entitlement` autoscaling rule by running:

```
cf create-autoscaling-rule APP-NAME cpu_entitlement MINIMUM-CPU-PERCENT-THRESHOLD MAXIMUM-CPU-PERCENT-THRESHOLD
```

Where:

- `APP-NAME` is the name of the app for which you want to create an autoscaling rule.
- `MINIMUM-CPU-PERCENT-THRESHOLD` is the minimum CPU Entitlement Utilization threshold as a percentage. If the average CPU Entitlement Utilization falls below this number, Autoscaler scales the number of app instances down. VMware recommends 30% as a default minimum threshold value.
- `MAXIMUM-CPU-PERCENT-THRESHOLD` is the maximum CPU Entitlement Utilization threshold as a percentage. If the average CPU Entitlement Utilization rises above this number, Autoscaler scales the number of app instances up. VMware recommends 80% as a default maximum threshold value.

The following example command configures a `cpu_entitlement` autoscaling rule for the `example-app` app, with a minimum CPU Entitlement Utilization threshold of 30% and a maximum CPU Entitlement Utilization threshold of 80%:

```
cf create-autoscaling-rule example-app cpu_entitlement 30 80
```

## Configure CPU Entitlement Utilization as the scaling metric for an app through Apps Manager

To configure Autoscaler to use CPU Entitlement Utilization as the scaling metric for an app using Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**. The **Manage Autoscaling** window appears.
5. Next to **Scaling Rules**, click **Add Rule**. The **Add Rule** window appears.
6. From the **Rule Type** options, select **CPU Entitlement Utilization**. Then click **Next**.
  1. For **Scale down if less than**, enter the minimum CPU Entitlement Utilization percentage threshold. If the average CPU Entitlement Utilization falls below this number, Autoscaler scales the number of app instances down. VMware recommends 30% as a default minimum threshold value.

2. For **Scale up if more than**, enter the maximum CPU Entitlement Utilization percentage threshold. If the average CPU Entitlement Utilization rises above this number, Autoscaler scales the number of app instances up. VMware recommends 80% as a default maximum threshold value.
7. Click **Save**.

## Review autoscaling events for changes in CPU Entitlement Utilization

When Autoscaler scales the number of app instances up after the CPU Entitlement Utilization metric increases above the maximum threshold, Autoscaler records an autoscaling event.

You can monitor the autoscaling events that Autoscaler records for changes in CPU Entitlement Utilization:

- Through the cf CLI. See [Review autoscaling events for changes in CPU Entitlement Utilization through the cf CLI](#).
- Through Apps Manager. See [Review autoscaling events for changes in CPU Entitlement Utilization through Apps Manager](#).

### Review autoscaling events for changes in CPU Entitlement Utilization through the cf CLI

To review the autoscaling events that Autoscaler records for changes in CPU Entitlement Utilization through the cf CLI:

1. In a terminal window, run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to review autoscaling events.

If Autoscaler has scaled the number of app instances up due to increases in the CPU Entitlement Utilization metric, the above command returns output that contains autoscaling events similar to the following example:

Time	Description
2024-03-13T21:47:45Z	Scaled up from 10 to 11 instances. Current CPU Entitlement usage of 172.28% is above upper threshold of 80.00%.

### Review autoscaling events for changes in CPU Entitlement Utilization through Apps Manager

To review the autoscaling events that Autoscaler records for changes in CPU Entitlement Utilization through Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**.

- Under **Event History**, click **View More**. A list of autoscaling events appears. If Autoscaler has scaled the number of app instances up due to increases in the CPU Entitlement Utilization metric, the list of autoscaling events includes events similar to the following example:

```
Scaled up from 10 to 11 instances. Current CPU Entitlement usage of 172.28% is above upper threshold of 80.00%.
```

## Special considerations for using CPU Entitlement Utilization as a scaling metric

This section describes use cases that might complicate or prevent you from configuring CPU Entitlement Utilization as the scaling metric for an app.

### Review current CPU Entitlement Utilization

The cf CLI (as of version v8.7.11) displays the cpu entitlement as well as the old cpu metric. The value is displayed in the `cpu entitlement` column as you can see in the example output below.

```
...
$ cf app example-app
Showing health and status for app example-app in org o / space s as admin...

name:           example-app
requested state:  started
routes:          example-app.apps.example.com
last uploaded:   Wed 16 Oct 23:35:15 UTC 2024
stack:          cflinuxfs4
buildpacks:
  name      version  detect  output  buildpack name
  ruby_buildpack  1.10.18  ruby        ruby

type:          web
sidecars:
instances:    1/1
memory usage: 1024M
  state  since            cpu      memory      disk      logging
  cpu entitlement details
#0  running  2024-10-16T23:35:32Z  0.3%  46.5M of 1G  130.9M of 1G  0B/s of 16K/
s  1.8%
...
```

### Log cache ejection

Within Log Cache, each app has its own bucket, which contains both app metrics and logs. By default, Log Cache can hold a maximum of 100,000 envelopes per app. Because the platform generates several envelopes per request, and recent app logs are held in the same bucket, a busy app might not have sufficient Log Cache CPU Entitlement Utilization history for Autoscaler to use in scaling decisions.

For more information, see [Log Cache](#) in *Operating App Autoscaler*.

### Using HTTP latency as a scaling metric

You can configure App Autoscaler to use the HTTP Request Latency metric to scale apps in your VMware TAS for VMs deployment.

## HTTP Request Latency Overview

When an HTTP request is made to an app, the Gorouter in VMware Tanzu Application Service for VMs (TAS for VMs) generates several metrics. One of these metrics is `gorouter.latency`, or *HTTP Request Latency*. The HTTP Request Latency metric measures the length of time it takes to process an HTTP request, starting from when the Gorouter receives a request and ending when the Gorouter completes processing the response from the app. This metric includes the length of time it takes all back-end endpoints to respond, including other apps and TAS for VMs components such as Cloud Controller and UAA. Long uploads, downloads, or app responses increase the time.

For example, you might have a Service Level Agreement (SLA) specifying that 95% of requests for an app must be processed in less than 300-milliseconds. To help achieve this, you can configure an autoscaling rule for Autoscaler to create additional instances of the app when the HTTP Request Latency metric reaches 250 milliseconds.

You can configure Autoscaler to use HTTP Request Latency as the scaling metric for an app in the following ways:

- Through the Cloud Foundry Command-Line Interface (cf CLI). For more information, see [Configuring HTTP Request Latency as the scaling metric for an app through the cf CLI](#).
- Through Apps Manager. For more information, see [Configure HTTP Request Latency as the scaling metric for an app through Apps Manager](#).

To monitor when Autoscaler scales an app based on changes in HTTP Request Latency, see [Reviewing autoscaling events for changes in HTTP Request Latency](#).

For information about use cases that might complicate or prevent you from configuring HTTP Request Latency as the scaling metric for an app, see [Special considerations for using HTTP Request Latency as a scaling metric](#).

VMware recommends that you load-test your app to verify that the autoscaling rules you configured are effective. For more information, see [Load-testing your app](#) in *Using Autoscaler in Production*.

For more information about the HTTP Request Latency metric, see [Router handling latency in Key Performance Indicators](#). For more information about how TAS for VMs routes HTTP requests, see [TAS for VMs routing architecture](#).

## Configure HTTP Request Latency as the scaling metric for an app through the cf CLI

The procedures in this section describe how to configure Autoscaler to use HTTP Request Latency as the scaling metric for an app through the cf CLI.

You can configure Autoscaler to use HTTP Request Latency as the scaling metric for an app in the following ways:

- Using a manifest file. For more information, see [Configure an autoscaling rule using a manifest file](#).
- Using CLI commands. For more information, see [Configure an autoscaling rule using CLI commands](#).

For the procedures in this section, you must use the App Autoscaler CLI plug-in. To download and install the App Autoscaler CLI plug-in, see [Install the App Autoscaler CLI plug-in](#) in *Using the App Autoscaler CLI*.

## Configure an autoscaling rule by using a manifest file

You can configure autoscaling rules declaratively through a manifest file. This manifest file only configures Autoscaler, and does not interfere with any other existing app manifest files in your TAS for VMs deployment.

To configure an autoscaling rule that defines HTTP Request Latency as its scaling metric using a manifest file:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- **ORG-NAME** is the name of the org containing the space in which the app you want to scale is deployed.
- **SPACE-NAME** is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have an Autoscaler service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
- **SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance in the previous step.

4. To create a manifest file for Autoscaler that configures an autoscaling rule with HTTP Request Latency as its scaling metric, create a YAML file that includes the following configuration parameters:

```
---
instance_limits:
  min: LOWER-SCALING-LIMIT
  max: UPPER-SCALING-LIMIT
rules:
- rule_type: http_latency
  rule_sub_type: PERCENTILE
  threshold:
    min: MINIMUM-LATENCY-THRESHOLD
    max: MAXIMUM-LATENCY-THRESHOLD
scheduled_limit_changes: []
```

Where:

- **LOWER-SCALING-LIMIT** is the minimum number of instances you want Autoscaler to create for the app.
- **UPPER-SCALING-LIMIT** is the maximum number of instances you want Autoscaler to create for the app.
- **PERCENTILE** is the percentile that Autoscaler uses in scaling decisions. Valid values are **avg\_95th** or **avg\_99th**. This value configures Autoscaler to ignore HTTP requests that fall outside either the 95th or 99th percentile and average the latency of the remaining 95% or 99% of HTTP requests.
- **MINIMUM-LATENCY-THRESHOLD** is the minimum HTTP Request Latency threshold in milliseconds. If the average latency of HTTP requests falls below this number, Autoscaler scales the number of app instances down.
- **MAXIMUM-LATENCY-THRESHOLD** is the maximum HTTP Request Latency threshold in milliseconds. If the average latency of HTTP requests rises above this number, Autoscaler scales the number of app instances up. To avoid excessive cycling, VMware recommends that you configure a maximum threshold that is at least twice the value of the minimum threshold.

The following example shows an Autoscaler manifest file with a percentile of 95%, a minimum HTTP Request Latency threshold of 125 milliseconds, and a maximum HTTP Request Latency threshold of 250 milliseconds:

```
---
instance_limits:
  min: 10
  max: 100
rules:
- rule_type: http_latency
  rule_sub_type: avg_95th
  threshold:
    min: 125
    max: 250
scheduled_limit_changes: []
```

5. Apply the autoscaling rule you configured in the previous step to the app you want to scale by running:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- **APP-NAME** is the name of the app.
- **MANIFEST-FILENAME** is the filename of the manifest file you created in the previous step.  
For example, `autoscaler.yml`.

## Configure an autoscaling rule by using CLI commands

To configure an autoscaling rule that defines HTTP Request Latency as its scaling metric using CLI commands:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- **ORG-NAME** is the name of the org containing the space in which the app you want to scale is deployed.
- **SPACE-NAME** is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have a service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-INSTANCE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance.  
For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
- **SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance in the previous step.

4. Configure upper and lower scaling limits for the app by running:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- APP-NAME is the name of the app.
- LOWER-SCALING-LIMIT is the minimum number of instances you want Autoscaler to create for the app.
- UPPER-SCALING-LIMIT is the maximum number of instances you want Autoscaler to create for the app.

5. Allow Autoscaler to begin making scaling decisions for the app by running:

```
cf enable-autoscaling APP-NAME
```

Where APP-NAME is the name of the app.

6. Create an http\_latency autoscaling rule by running:

```
cf create-autoscaling-rule APP-NAME http_latency MINIMUM-LATENCY-THRESHOLD MAXIMUM-LATENCY-THRESHOLD --subtype PERCENTILE
```

Where:

- APP-NAME is the name of the app for which you want to create an autoscaling rule.
- MINIMUM-LATENCY-THRESHOLD is the minimum HTTP Request Latency threshold in milliseconds. If the average latency of HTTP requests falls below this number, Autoscaler scales the number of app instances down.
- MAXIMUM-LATENCY-THRESHOLD is the maximum HTTP Request Latency threshold in milliseconds. If the average latency of HTTP requests rises above this number, Autoscaler scales the number of app instances up. To avoid excessive cycling, VMware recommends that you configure a maximum threshold that is at least twice the value of the minimum threshold.
- PERCENTILE is the percentile that Autoscaler uses in scaling decisions. Valid values are avg\_95th or avg\_99th. This value configures Autoscaler to ignore HTTP requests that fall outside either the 95th or 99th percentile and average the latency of the remaining 95% or 99% of HTTP requests.

The following example command configures an http\_latency autoscaling rule for the example-app app, with a minimum HTTP Request Latency threshold of 125-milliseconds, a maximum HTTP Request Latency threshold of 250-milliseconds, and a percentile of 95%:

```
cf create-autoscaling-rule example-app http_latency 125 250 --subtype avg_95th
```

## Configure HTTP Request Latency as the scaling metric for an app through Apps Manager

To configure Autoscaler to use HTTP Request Latency as the scaling metric for an app through Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.

3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**. The **Manage Autoscaling** window appears.
5. Next to **Scaling Rules**, click **Add Rule**. The **Add Rule** window appears.
6. From the **Rule Type** options, select **HTTP Request Latency**. Then click **Next**.
  1. For **Scale down if less than**, enter in milliseconds the minimum HTTP Request Latency threshold you want to configure. If the average latency of HTTP requests falls below this number, Autoscaler scales the number of app instances down.
  2. For **Scale up if more than**, enter in milliseconds the maximum HTTP Request Latency threshold you want to configure. If the average latency of HTTP requests rises above this number, Autoscaler scales the number of app instances up. To avoid excessive cycling, VMware recommends that you configure a maximum threshold that is at least twice the value of the minimum threshold.
  3. Under **Percent of traffic to apply**, select either **95%** or **99%**. This configuration setting is the percentile that Autoscaler uses in scaling decisions. Depending on which option you select, Autoscaler ignores HTTP requests that fall outside either the 95th or 99th percentile and averages the latency of the remaining 95% or 99% of HTTP requests.
7. Click **Save**.

## Reviewing autoscaling events for changes in HTTP Request Latency

When Autoscaler scales the number of app instances up after the HTTP Request Latency metric increases above the maximum HTTP Request Latency threshold, Autoscaler records an autoscaling event.

You can monitor the autoscaling events that Autoscaler records for changes in HTTP Request Latency in the following ways:

- Through the cf CLI. See [Review autoscaling events for changes in HTTP Request Latency through the cf CLI](#).
- Through Apps Manager. See [Review autoscaling events for changes in HTTP Request Latency through Apps Manager](#).

### Review autoscaling events for changes in HTTP Request Latency through the cf CLI

To review the autoscaling events that Autoscaler records for changes in HTTP Request Latency through the cf CLI:

1. In a terminal window, run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to review autoscaling events.

If Autoscaler has scaled the number of app instances up due to increases in the HTTP Request

Latency metric, the above command returns output that contains autoscaling events similar to the following example:

Time	Description
2022-05-23T21:47:45Z	Scaled up from 10 to 11 instances. Current HTTP Latency of 1010.96ms is above upper threshold of 250.00ms.

## Review autoscaling events for changes in HTTP Request Latency through Apps Manager

To review the autoscaling events that Autoscaler records for changes in HTTP Request Latency through Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**.
5. Under **Event History**, click **View More**. A list of autoscaling events appears. If Autoscaler has scaled the number of app instances up due to increases in the HTTP Request Latency metric, the list of autoscaling events includes events similar to the following example:

Scaled up from 10 to 11 instances. Current HTTP Latency of 1010.96ms is above upper threshold of 250.00ms.

## Special considerations for using HTTP Request Latency as a scaling metric

This section describes use cases that might complicate or prevent you from configuring HTTP Request Latency as the scaling metric for an app.

### Multiple endpoints

In an app that exposes multiple endpoints, the value of the HTTP Request Latency metric is the average HTTP Request Latency across all app endpoints. If one or more endpoints process requests at a slower rate than the others, HTTP Request Latency might not be an ideal scaling metric to use. Even a fast endpoint might cause the average HTTP Request Latency to increase if it receives a large number of requests.

### External factors

Components or services that receive data from an app are known as *downstream* components. If any downstream components respond slowly to requests from an app, they might cause HTTP Request Latency to increase. In this case, scaling the app up does not improve its performance. In fact, scaling the app up might *increase* HTTP Request Latency, because requests from the additional app instances add a greater burden on the downstream component. The downstream component must be scaled up or improved before scaling the app up might improve its performance.

Other external factors, such as network congestion or database performance, can also cause HTTP Request Latency to increase. In this case, scaling the app does not decrease HTTP Request Latency that results from these external factors.

## Container-to-container networking

Autoscaler can only use HTTP Request Latency as a scaling metric for apps that receive requests directly through the Gorouter. Autoscaler does not support using HTTP Request Latency as a scaling metric for apps that receive requests from other apps through container-to-container (C2C) networking or TCP routers.

If your app relies on back-end HTTP services that apps in your TAS for VMs deployment must access through C2C networking, the Gorouter does not generate HTTP events for those requests. As a result, Autoscaler cannot scale those HTTP services. For Autoscaler to scale them, you must either use a different default scaling metric or create a custom scaling metric for them.

## Log cache ejection

Autoscaler retrieves HTTP metrics from Log Cache, which might hold a maximum of 100,000 envelopes per app by default. If your app receives a large number of HTTP requests or is configured to create very verbose logs, Log Cache might drop some of the timer envelopes that it holds. If Autoscaler can only retrieve some of the total timer envelopes it requires to calculate accurate metrics, then the HTTP Request Latency metric might inaccurately represent the actual HTTP Request Latency of the app or causes of decreased app performance. However, in most cases, the HTTP Request Latency metric still approximates the actual HTTP Request Latency of the app.

For more information, see [Log cache](#) in *Operating App Autoscaler*.

## Infrequent requests

If an app receives requests infrequently and responds slowly, Autoscaler might continue scaling the app up because there are no other HTTP Request Latency metrics to restore the average. In this case, Autoscaler usually stops scaling the app up after the original request falls outside of the metric collection interval.

For more information about how Autoscaler's metric collection interval affects its scaling decisions, see [How App Autoscaler decides when to scale](#) in *About App Autoscaler*.

## Using RabbitMQ queue depth as a scaling metric

You can configure App Autoscaler to use the RabbitMQ queue depth metric to scale apps in your VMware TAS for VMs deployment.

RabbitMQ is a message broker that communicates using message queues. Queue depth is the number of messages in a RabbitMQ queue that are waiting to be dequeued. You can configure Autoscaler to use RabbitMQ queue depth as the scaling metric for apps that consume messages from RabbitMQ queues for processing. When Autoscaler scales these apps up, they can process these RabbitMQ queues more quickly.

You can configure Autoscaler to use RabbitMQ queue depth as the scaling metric for an app:

- Through the Cloud Foundry Command-Line Interface (cf CLI). See [Configuring RabbitMQ queue depth as the scaling metric for an app through the cf CLI](#).

- Through Apps Manager. See [Configure RabbitMQ queue depth as the scaling metric for an app through Apps Manager](#).

You can also configure Autoscaler to query queues on an external RabbitMQ cluster by creating a user-provided service that represents the external RabbitMQ cluster. For more information, see [Use an external RabbitMQ cluster](#).

To monitor when Autoscaler scales an app based on changes in RabbitMQ queue depth, see [Reviewing autoscaling events for changes in RabbitMQ queue depth](#).

For information about use cases that might complicate or prevent you from configuring RabbitMQ queue depth as the scaling metric for an app, see [Special considerations for using RabbitMQ queue depth as a scaling metric](#).

VMware recommends that you load-test your app to verify that the autoscaling rules you configured are effective. For more information, see [Load-testing your app](#) in *Using Autoscaler in Production*.

For more information about RabbitMQ queues, see the [RabbitMQ documentation](#).

## Configuring RabbitMQ queue depth as the scaling metric for an app through the cf CLI

The procedures in this section describe how to configure Autoscaler to use RabbitMQ queue depth as the scaling metric for an app through the cf CLI.

You can configure Autoscaler to use RabbitMQ queue depth as the scaling metric for an app in the following ways:

- Using a manifest file. For more information, see [Configure an autoscaling rule using a manifest file](#).
- Using CLI commands. For more information, see [Configure an autoscaling rule using CLI commands](#).

For the procedures in this section, you must use the App Autoscaler CLI plug-in. To download and install the App Autoscaler CLI plug-in, see [Install the App Autoscaler CLI plug-in](#) in *Using the App Autoscaler CLI*.

### Configure an autoscaling rule using a manifest file

You can configure autoscaling rules through a manifest file. This manifest file only configures Autoscaler, and does not interfere with any other existing app manifest files in your TAS for VMs deployment.

To configure an autoscaling rule that defines RabbitMQ queue depth as its scaling metric using a manifest file:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- `ORG-NAME` is the name of the org containing the space in which the app you want to scale is deployed.
- `SPACE-NAME` is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have an Autoscaler service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
- **SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance in the previous step.

4. To create a manifest file for Autoscaler that configures an autoscaling rule with RabbitMQ queue depth as its scaling metric, create a YAML file that includes the following configuration parameters:

```
---
instance_limits:
  min: LOWER-SCALING-LIMIT
  max: UPPER-SCALING-LIMIT
rules:
- rule_type: rabbitmq
  rabbitmq_service: RABBITMQ-SERVICE-INSTANCE-NAME
  rule_sub_type: QUEUE-NAME
  threshold:
    min: MINIMUM-QUEUE-DEPTH-THRESHOLD
    max: MAXIMUM-QUEUE-DEPTH-THRESHOLD
  scheduled_limit_changes: []
```

Where:

- **LOWER-SCALING-LIMIT** is the minimum number of instances you want Autoscaler to create for the app.
- **UPPER-SCALING-LIMIT** is the maximum number of instances you want Autoscaler to create for the app.
- (Optional) **RABBITMQ-SERVICE-INSTANCE-NAME** is the name of the RabbitMQ service instance you want Autoscaler to query. Defining this parameter ensures that Autoscaler does not unnecessarily query other RabbitMQ service instances that are bound to the app.

- `QUEUE-NAME` is the name of the queue you want Autoscaler to monitor. This queue must be on a RabbitMQ service instance that is bound to the app you want to scale.
- `MINIMUM-QUEUE-DEPTH-THRESHOLD` is the minimum queue depth threshold. If the average queue depth falls below this number of messages, Autoscaler scales the number of app instances down.
- `MAXIMUM-QUEUE-DEPTH-THRESHOLD` is the maximum queue depth threshold. If the average queue depth rises above this number of messages, Autoscaler scales the number of app instances up.

The following example shows an Autoscaler manifest file monitoring the `example_queue` queue on the `example-service` RabbitMQ service instance, with a minimum queue depth threshold of 10 and a maximum queue depth threshold of 50:

```
---
instance_limits:
  min: 10
  max: 100
rules:
- rule_type: rabbitmq
  rabbitmq_service: example-service
  rule_sub_type: example_queue
  threshold:
    min: 10
    max: 50
scheduled_limit_changes: []
```

5. Apply the autoscaling rule you configured in the previous step to the app you want to scale by running:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- `APP-NAME` is the name of the app.
- `MANIFEST-FILENAME` is the filename of the manifest file you created in the previous step. For example, `autoscaler.yaml`.

## Configure an autoscaling rule using CLI commands

To configure an autoscaling rule that defines RabbitMQ queue depth as its scaling metric using CLI commands:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- `ORG-NAME` is the name of the org containing the space in which the app you want to scale is deployed.
- `SPACE-NAME` is the name of the space in which the app you want to scale is deployed.

- If the space in which the app you want to scale is deployed does not already have a service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-INSTANCE-NAME
```

Where:

- PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance.  
For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

- Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- APP-NAME** is the name of the app you want to scale.
- SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance in the previous step.

- Configure upper and lower scaling limits for the app by running:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- APP-NAME** is the name of the app.
- LOWER-SCALING-LIMIT** is the minimum number of instances you want Autoscaler to create for the app.
- UPPER-SCALING-LIMIT** is the maximum number of instances you want Autoscaler to create for the app.

- Set Autoscaler to begin making scaling decisions for the app by running:

```
cf enable-autoscaling APP-NAME
```

Where **APP-NAME** is the name of the app.

- Create a `rabbitmq` autoscaling rule by running:

```
cf create-autoscaling-rule APP-NAME rabbitmq MINIMUM-QUEUE-DEPTH-THRESHOLD MAXI
MUM-QUEUE-DEPTH-THRESHOLD --rabbitmq-instance RABBITMQ-SERVICE-INSTANCE-NAME --
subtype QUEUE-NAME
```

Where:

- APP-NAME** is the name of the app for which you want to create an autoscaling rule.

- `MINIMUM-QUEUE-DEPTH-THRESHOLD` is the minimum queue depth threshold. If the average queue depth falls below this number of messages, Autoscaler scales the number of app instances down.
- `MAXIMUM-QUEUE-DEPTH-THRESHOLD` is the maximum queue depth threshold. If the average queue depth rises above this number of messages, Autoscaler scales the number of app instances up.
- (Optional) `RABBITMQ-SERVICE-INSTANCE-NAME` is the name of the RabbitMQ service instance you want Autoscaler to query. Defining this parameter ensures that Autoscaler does not unnecessarily query other RabbitMQ service instances that are bound to the app.
- `QUEUE-NAME` is the name of the queue you want Autoscaler to monitor. This queue must be on a RabbitMQ service instance that is bound to the app you want to scale.

The following example command configures a `rabbitmq` autoscaling rule for the `example-app` app that monitors the `example_queue` queue on the `example-service` RabbitMQ service instance, with a minimum queue depth threshold of 10 and a maximum queue depth threshold of 50 milliseconds:

```
cf create-autoscaling-rule example-app rabbitmq 10 50 --rabbitmq-instance example-service --subtype example_queue
```

## Configure RabbitMQ queue depth as the scaling metric for an app through Apps Manager

To configure Autoscaler to use RabbitMQ queue depth as the scaling metric for an app using Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**. The **Manage Autoscaling** window appears.
5. Next to **Scaling Rules**, click **Add Rule**. The **Add Rule** window appears.
6. From the **Rule Type** options, select **RabbitMQ**. Then click **Next**.
  1. For **Scale down if less than**, enter the minimum queue depth threshold. If the average queue depth falls below this number of messages, Autoscaler scales the number of app instances down.
  2. For **Scale up if more than**, enter the maximum queue depth threshold. If the average queue depth rises above this number of messages, Autoscaler scales the number of app instances up.
  3. For **Queue name**, enter the name of the queue you want Autoscaler to monitor. This queue must be on a RabbitMQ service instance that is bound to the app you want to scale.
7. Click **Save**.

## Use an external RabbitMQ cluster

If your RabbitMQ queue is hosted on an external RabbitMQ cluster, you can create a user-provided service that represents the external RabbitMQ cluster. Autoscaler can query this user-provided service to retrieve queue metadata.

To use a user-provided service for your external RabbitMQ cluster:

1. Activate the RabbitMQ management plug-in on your RabbitMQ cluster by following the procedures in the [RabbitMQ documentation](#). Autoscaler can use the RabbitMQ HTTP Management API to discover the depth of the queues in the RabbitMQ cluster.
2. In a terminal window, run:

```
cf create-user-provided-service SERVICE-NAME -p '{"uri": "amqp://USERNAME:PASSWORD@RABBITMQ-FQDN", "http_api_uri": "http://USERNAME:PASSWORD@RABBITMQ-FQDN:15672/api/", "vhost": "VHOST"}' \ -t rabbitmq
```

Where:

- **SERVICE-NAME** is the name you want to give the user-provided service.
- **USERNAME** is the username you want to configure for the external RabbitMQ cluster.
- **PASSWORD** is the password you want to configure for the external RabbitMQ cluster, with URI reserved characters percent-encoded as listed and described in IETF [RFC 3986](#).
- **RABBITMQ-FQDN** is the fully-qualified domain name (FQDN) of the RabbitMQ cluster.
- **VHOST** is the RabbitMQ virtual host you want the user-provided service to use.



If you do not define the `"vhost"` parameter, Autoscaler requests queue metadata for all queues on the RabbitMQ cluster. This is a very expensive operation. For more information about RabbitMQ virtual hosts, see the [RabbitMQ documentation](#).

3. Bind the user-provided service to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
- **SERVICE-NAME** is the name of the user-provided service you created in the previous step.



Depending on the app to which you bind the user-provided service, you might need to configure the `VCAP_SERVICES` environment variable to approve accessing the user-provided service. For more information, see the [VMware Tanzu RabbitMQ for VMs documentation](#).

After you bind the user-provided service to the app, configure Autoscaler to use RabbitMQ queue depth as the scaling metric for an app by following one of the procedures in [Configuring RabbitMQ queue depth as the scaling metric for an app through the cf CLI](#) or [Configuring RabbitMQ queue depth as the scaling metric for an app through Apps Manager](#).

# Reviewing autoscaling events for changes in RabbitMQ queue depth

When Autoscaler scales the number of app instances up after the RabbitMQ queue depth metric increases above the maximum queue depth threshold, Autoscaler records an autoscaling event.

You can monitor the autoscaling events that Autoscaler records for changes in RabbitMQ queue depth:

- Through the cf CLI. See [Review autoscaling events for changes in RabbitMQ queue depth through the cf CLI](#).
- Through Apps Manager. See [Review autoscaling events for changes in RabbitMQ queue depth through Apps Manager](#).

## Review autoscaling events for changes in RabbitMQ queue depth through the cf CLI

To review the autoscaling events that Autoscaler records for changes in RabbitMQ queue depth through the cf CLI:

1. In a terminal window, run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to review autoscaling events.

If Autoscaler has scaled the number of app instances up due to increases in the RabbitMQ queue depth metric, the above command returns output that contains autoscaling events similar to the following example:

Time	Description
2022-05-24T20:47:34Z	Scaled up from 10 to 11 instances. The RabbitMQ message depth in <code>example_queue</code> is at an average of 50.35, which is above the maximum threshold of 50.00.

## Review events in RabbitMQ queue

To review the autoscaling events that Autoscaler records for changes in RabbitMQ queue depth through Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**.
5. Under **Event History**, click **View More**. A list of autoscaling events appears. If Autoscaler has scaled the number of app instances up due to increases in the RabbitMQ queue depth metric, the list of autoscaling events includes events similar to the following example:

```
Scaled up from 10 to 11 instances. The RabbitMQ message depth in example_queue is at an average of 50.35, which is above the maximum threshold of 50.00.
```

## Special considerations for using RabbitMQ queue depth as a scaling metric

This section describes use cases that complicate or prevent you from configuring RabbitMQ queue depth as the scaling metric for an app. For more information, see the sections following:

- [RabbitMQ service binding credentials in runtime CredHub](#).
- [Multiple RabbitMQ service instances](#).

### RabbitMQ service binding credentials in runtime CredHub

To receive RabbitMQ queue depth metrics, Autoscaler must retrieve service binding credentials for the RabbitMQ HTTP Management API from Cloud Controller. However, when a TAS for VMs deployment is configured to store credentials in runtime CredHub, Autoscaler cannot retrieve service binding credentials from Cloud Controller.

For more information, see [Autoscaler does not support runtime CredHub](#) in *Troubleshooting App Autoscaler*.

### Multiple RabbitMQ service instances

If an app is bound to more than one RabbitMQ service instance, and the autoscaling rules you configure for the app do not specify the name of a particular RabbitMQ service instance name, Autoscaler queries all RabbitMQ service instances that are bound to the app for the specified queue. To avoid this, specify the name of the RabbitMQ service instance that hosts the queue you want to monitor when you configure autoscaling rules for the app.

## Use custom scaling metrics

You can configure App Autoscaler to use Custom App Metrics when scaling apps in your VMware TAS for VMs deployment.

For information about how to emit Custom App Metrics, see [Using Metric Registrar](#).

## Custom scaling metrics overview

While Autoscaler can use several default metrics as scaling metrics for apps, your app might require specific autoscaling requirements that Autoscaler cannot meet by using the default scaling metrics to scale the app. In this case, you might create Custom App Metrics for Autoscaler to use to scale the app.

Before configuring Autoscaler to use a custom scaling metric, you must register the metrics endpoint of the app with the Metric Registrar. For more information, see [Using Metric Registrar](#).

You can configure Autoscaler to use a custom scaling metric for an app in the following ways:

- Through the Cloud Foundry Command-Line Interface (cf CLI). For more information, see [Configuring a custom scaling metric for an app through the cf CLI](#).
- Through Apps Manager. For more information, see [Configure a custom scaling metric for an app through Apps Manager](#).

To monitor when Autoscaler scales an app based on changes in a custom scaling metric, see [Reviewing autoscaling events for changes in a custom scaling metric](#).

For information about use cases that might complicate or prevent you from configuring a custom scaling metric for an app, see [Special Considerations for using a custom scaling metric](#).

VMware recommends that you load test your app to verify that the autoscaling rules you configured are effective. For more information, see [Load-testing your app](#) in *Using Autoscaler in Production*.

## Configure a custom scaling metric for an app through the cf CLI

The procedures in this section describe how to configure Autoscaler to use a custom scaling metric for an app through the cf CLI.

You can configure Autoscaler to use a custom scaling metric for an app in the following ways:

- Using a manifest file. For more information, see [Configure an autoscaling rule using a manifest file](#).
- Using CLI commands. For more information, see [Configure an autoscaling rule using CLI commands](#).

For the procedures in this section, you must use the App Autoscaler CLI plug-in. To download and install the App Autoscaler CLI plug-in, see [Install the app Autoscaler CLI plug-in](#) in *Using the App Autoscaler CLI*.

### Configure an autoscaling rule by using a manifest rule

You can configure autoscaling rules declaratively through a manifest file. This manifest file only configures Autoscaler, and does not interfere with any other existing app manifest files in your TAS for VMs deployment.

To configure an autoscaling rule that defines a custom scaling metric using a manifest file:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- **ORG-NAME** is the name of the org containing the space in which the app you want to scale is deployed.
- **SPACE-NAME** is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have an Autoscaler service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance.  
For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

- Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- APP-NAME is the name of the app you want to scale.
- SERVICE-INSTANCE-NAME is the name of the Autoscaler service instance in the previous step.

- To create a manifest file for Autoscaler that configures an autoscaling rule with a custom scaling metric, create a YAML file that includes the following configuration parameters:

```
---
instance_limits:
  min: LOWER-SCALING-LIMIT
  max: UPPER-SCALING-LIMIT
rules:
- rule_type: custom
  metric: METRIC-NAME
  threshold:
    min: MINIMUM-METRIC-THRESHOLD
    max: MAXIMUM-METRIC-THRESHOLD
scheduled_limit_changes: []
```

Where:

- LOWER-SCALING-LIMIT is the minimum number of instances you want Autoscaler to create for the app.
- UPPER-SCALING-LIMIT is the maximum number of instances you want Autoscaler to create for the app.
- METRIC-NAME is the name of the custom scaling metric. This name must match the name of the metric that the app exposes.
- MINIMUM-METRIC-THRESHOLD is the minimum custom scaling metric threshold. If the average value of the custom scaling metric falls below this number, Autoscaler scales the number of app instances down.
- MAXIMUM-METRIC-THRESHOLD is the maximum custom scaling metric threshold. If the average custom scaling metric rises above this number, Autoscaler scales the number of app instances up.

The following example shows an Autoscaler manifest file configuring Autoscaler to use example\_metric as its custom scaling metric, with a minimum custom scaling metric threshold of 20 and a maximum custom scaling metric threshold of 50:

```
---
instance_limits:
  min: 10
  max: 100
rules:
- rule_type: custom
```

```

metric: example_metric
threshold:
  min: 20
  max: 50
scheduled_limit_changes: []

```

5. Apply the Autoscaler manifest for your app:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- **APP-NAME** is the name of the app that you want Autoscaler to scale.
- **MANIFEST-FILENAME** is the filename of the Autoscaler manifest.

6. Apply the autoscaling rule you configured in the previous step to the app you want to scale by running:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- **APP-NAME** is the name of the app.
- **MANIFEST-FILENAME** is the filename of the manifest file you created in the previous step.  
For example, `autoscaler.yaml`.

## Configure an autoscaling rule using CLI commands

To configure an autoscaling rule that defines a custom scaling metric using CLI commands:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- **ORG-NAME** is the name of the org containing the space in which the app you want to scale is deployed.
- **SPACE-NAME** is the name of the space in which the app you want to scale is deployed.

2. If the space in which the app you want to scale is deployed does not already have a service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-INSTANCE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance.  
For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

- Bind the Autoscaler service instance you created in the previous step to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- APP-NAME is the name of the app you want to scale.
- SERVICE-INSTANCE-NAME is the name of the Autoscaler service instance in the previous step.

- Configure upper and lower scaling limits for the app by running:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- APP-NAME is the name of the app.
- LOWER-SCALING-LIMIT is the minimum number of instances you want Autoscaler to create for the app.
- UPPER-SCALING-LIMIT is the maximum number of instances you want Autoscaler to create for the app.

- To set Autoscaler to begin making scaling decisions for the app by running:

```
cf enable-autoscaling APP-NAME
```

Where APP-NAME is the name of the app.

- Create a custom autoscaling rule by running:

```
cf create-autoscaling-rule APP-NAME custom MINIMUM-METRIC-THRESHOLD MAXIMUM-METRIC-THRESHOLD --metric METRIC-NAME
```

Where:

- APP-NAME is the name of the app for which you want to create an autoscaling rule.
- MINIMUM-METRIC-THRESHOLD is the minimum custom scaling metric threshold. If the average value of the custom scaling metric falls below this number, Autoscaler scales the number of app instances down.
- MAXIMUM-METRIC-THRESHOLD is the maximum custom scaling metric threshold. If the average custom scaling metric rises above this number, Autoscaler scales the number of app instances up.
- METRIC-NAME is the name of the custom scaling metric. This name must match the name of the metric that the app exposes.

The following example command configures a custom autoscaling rule for the example-app app that uses example\_metric as its custom scaling metric, with a minimum custom scaling metric

threshold of 20 and a maximum custom scaling metric threshold of 50:

```
cf create-autoscaling-rule example-app custom 20 50 --metric example_metric
```

## Configure a custom scaling metric for an app through Apps Manager

To configure Autoscaler to use a custom scaling metric for an app using Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**. The **Manage Autoscaling** window appears.
5. Next to **Scaling Rules**, click **Add Rule**. The **Add Rule** window appears.
6. From the **Rule Type** options, select **Custom**. Then click **Next**.
  1. For **Scale down if less than**, enter the minimum custom scaling metric threshold. If the average value of the custom scaling metric falls below this number, Autoscaler scales the number of app instances down.
  2. For **Scale up if more than**, enter the maximum custom scaling metric threshold. If the average value of the custom scaling metric rises above this number, Autoscaler scales the number of app instances up.
  3. For **Metric**, enter the name of the custom scaling metric. This name must match the name of the metric that the app exposes.
7. Click **Save**.

## Reviewing autoscaling events for changes in custom scaling metrics

When Autoscaler scales the number of app instances up after the custom scaling metric for an app increases above the maximum queue depth threshold, Autoscaler records an autoscaling event.

You can monitor the autoscaling events that Autoscaler records for changes in the custom scaling metric for an app in the following ways:

- Through the cf CLI. For more information, see [Review autoscaling events for changes in custom scaling metrics through the cf CLI](#).
- Through Apps Manager. For more information, see [Review autoscaling events for changes in custom scaling metrics through Apps Manager](#).

### Review autoscaling events for changes in custom scaling metrics through the cf CLI

To review the autoscaling events that Autoscaler records for changes in the custom scaling metric for an app through the cf CLI:

1. In a terminal window, run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to review autoscaling events.

If Autoscaler has scaled the number of app instances up due to increases in the custom scaling metric for the app, the above command returns output that contains autoscaling events similar to the following example:

Time	Description
2022-05-25T23:13:27Z	Scaled up from 10 to 11 instances. Current example_metric of 60.83 is above upper threshold of 50.00.

## Review autoscaling events for changes in custom scaling metrics through Apps Manager

To review the autoscaling events that Autoscaler records for changes in the custom scaling metric for an app through Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**.
5. Under **Event History**, click **View More**. A list of autoscaling events appears. If Autoscaler has scaled the number of app instances up due to increases in the custom scaling metric for the app, the list of autoscaling events includes events similar to the following example:

```
Scaled up from 10 to 11 instances. Current example_metric of 60.83 is above upper threshold of 50.00.
```

## Special considerations for using custom scaling metrics

This section describes use cases that might complicate or prevent you from configuring a custom scaling metric for an app.

### Metric visibility

Metric endpoints include potentially sensitive information about the state of an app. Before you configure a custom scaling metric, ensure that unauthorized end users cannot access these endpoints.

To prevent unauthorized end users from accessing an app, you can configure the metrics endpoint to process traffic through a separate port. When registering the endpoint using the Metric Registrar CLI, you can use the `--internal-port` flag to specify which port the endpoint uses.

### Counter metrics

Autoscaler cannot use counter metrics as custom scaling metrics. If you register a metrics endpoint that includes counter metrics, the counter metrics are sent to Loggregator, but Autoscaler does not retrieve them from Log Cache.

## Metric labels

Autoscaler does not differentiate between metrics based on labels. If the metrics endpoint features the same metric with different labels, such as HTTP Request Latency metrics with labels that describe the endpoint from which they came, Autoscaler does not recognize the labels.

## High metric load

Configuring an app to emit a large number of custom scaling metrics might cause your TAS for VMs deployment to have difficulty processing those metrics. To create a large number of custom scaling metrics, consult the operator of your TAS for VMs deployment.

## Log cache ejection

The Metric Registrar scrapes the metrics endpoint on an app and emits the custom scaling metrics it receives. By default, the interval between scrapes is 35 seconds. You can configure this scrape interval in the **Metric Registrar** pane of the TAS for VMs tile. To configure the scrape interval for the Metric Registrar, see [Edit Default Scraping Interval](#) in *Configuring TAS for VMs*.

Within Log Cache, each app has its own bucket, which contains both app metrics and logs. By default, Log Cache can hold a maximum of 100,000 envelopes per app. Because the platform generates several envelopes per request, and recent app logs are held in the same bucket, a busy app might not have sufficient Log Cache Custom App Metric history for Autoscaler to use in scaling decisions.

For more information, see [Log Cache](#) in *Operating App Autoscaler*.

## Tutorial: Scaling a Spring app on a custom scaling metric

You can scale an app with Autoscaler in your TAS for VMs deployment based on a Custom App Metric.

In a VMware Tanzu Application Service for VMs (TAS for VMs) deployment, Autoscaler can scale apps based on Custom App Metrics. The table describes the main components involved in this workflow and how they correspond to steps in this tutorial.

Component	Description	Related Tutorial Steps
App	The app must emit Custom App Metrics by exposing a Prometheus endpoint. This tutorial includes a sample Spring app, <code>java-spring-security</code> , that emits such metrics. For more information about Prometheus, see the <a href="#">Prometheus documentation</a> .	<a href="#">Review the sample spp and Push the sample app</a>
Metric Registrar	The Metric Registrar is a component of TAS for VMs you can export custom app metrics to Loggregator. You issue commands to the Metric Registrar through the Metric Registrar CLI plug-in. For more information about the Metric Registrar, see <a href="#">Metric registrar and custom app metrics</a> .	<a href="#">Register a Custom App Metrics endpoint</a>

Component	Description	Related Tutorial Steps
App Autoscaler	Autoscaler is a service integrated with Apps Manager that scales apps in your TAS for VMs deployment based on the scaling metrics or schedule that you configure. For more information, see <a href="#">Scaling an app using App Autoscaler</a> .	Create an autoscaling rule and <a href="#">Trigger scaling</a>

## Prerequisites

This tutorial requires:

- A TAS for VMs deployment in which the Metric Registrar is activated. To configure the Metric Registrar, see [Configure the Metric Registrar in Metric Registrar and Custom App Metrics](#).
- Access to Apps Manager in the TAS for VMs deployment. To access Apps Manager, see [Logging in to Apps Manager](#).
- The ability to push an app to the TAS for VMs deployment. For more information, see [Prerequisites in Pushing an App](#) and [Manage users and roles](#) in [Getting Started with the cf CLI](#).



You must have `SpaceDeveloper` permissions in at least one space.

- The Cloud Foundry Command-Line Interface (cf CLI). To install the cf CLI, see [Installing the cf CLI](#)
- A Java 17 JRE
- Access to a command-line for running commands such as cf CLI and GIT commands

## Review the sample app

To review the code for the sample app, `java-spring-security`, see the [metric-registrar-examples](#) repository on GitHub. This sample app is a Spring app with a user interface (UI) that includes several buttons to call different endpoints. Some of these endpoints are instrumented to produce metrics.

You can see what the UI looks like in [Push the sample app](#). The following sections provide some details about the code.

## Dependencies

You can view the app dependencies in the `build.gradle` file.

The dependencies include [Micrometer Prometheus](#), which creates a prometheus metrics endpoint at `/actuator/prometheus` that can be scraped by Metric Registrar.

## Instrumentation

This section describes how the app is instrumented. Instrumentation refers to how metrics were added for a particular function.

See the `ExampleController.java` file from the sample app code:

- The `ExampleController` class includes a `MeterRegistry` object, which is passed and set in the constructor.

```

private MeterRegistry registry;
private AtomicLong custom;

public ExampleController(MeterRegistry registry) {
    this.registry = registry;
    this.custom = new AtomicLong(0L);
}

```

- It also includes a `custom` variable that is initialized in the constructor. In the `customMetric` handler, this variable gets passed to the registry and incremented or decremented.

```

public ResponseEntity<String> customMetric(@RequestParam(value="inc", defaultValue="") String increment) {
    AtomicLong customGauge = registry.gauge("custom", this.custom);
    if (!"".equals(increment)) {
        customGauge.incrementAndGet();
    } else {
        customGauge.decrementAndGet();
    }
}

```

The App Autoscaler only scales on a gauge, or metric, that can go up and down. The standard metrics of CPU Entitlement Utilization, Container Memory Utilization, HTTP Request Throughput, and HTTP Request Latency are all gauges.

## Push the sample app

To push the sample app:

- Open a terminal window and clone the git repository that contains the sample app:

```
git clone https://github.com/pivotal-cf/metric-registrar-examples.git
```

- Navigate to the `java-spring-security` app directory:

```
cd metric-registrar-examples/java-spring-security
```

- Build the app by running:

```
./gradlew build
```

- Push the app with a random route:

```
cf push java-spring-security --random-route
```

The previous command returns output similar to this example:

```

Waiting for app to start...
Uploaded droplet (60.5M)
Uploading complete
Cell 333e7fdf-806e-424d-b3a0-78967ecb6d28 stopping instance 6f345835-8b
eb-48a5-b578-921f5de442c6

name:          java-spring-security

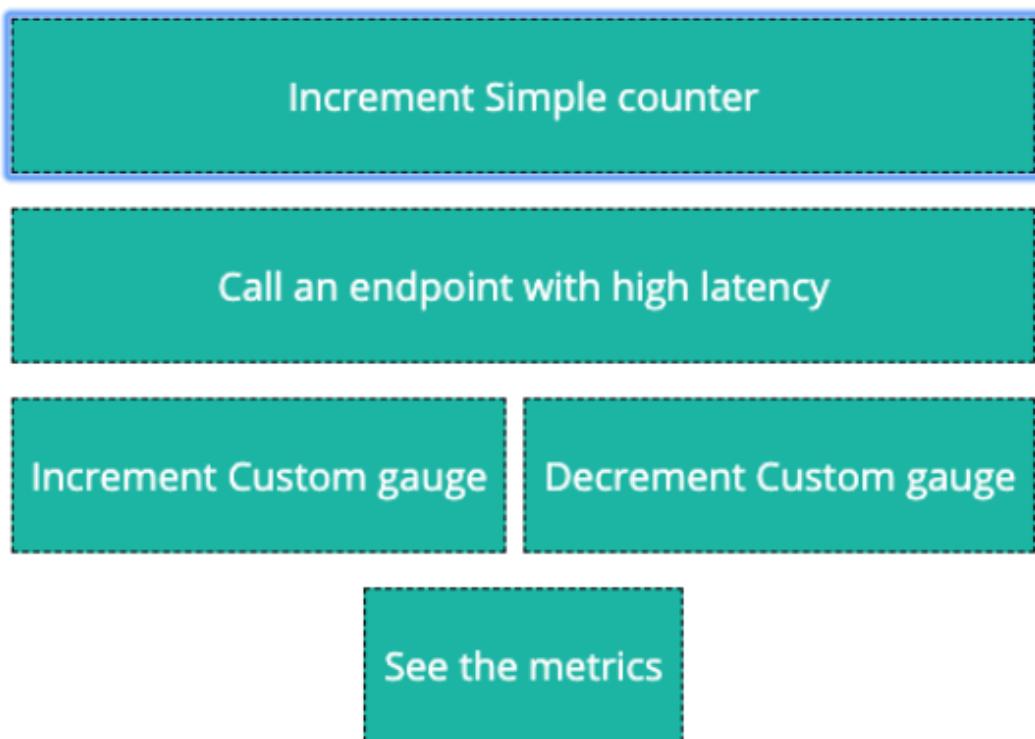
```

```
requested state: started
routes:           java-spring-security-random-route.cfapps.io
last uploaded:    Wed 28 Aug 11:02:33 PDT 2019
```

5. From the `routes` section of the terminal output, record the URL of the `java-spring-security` app. In the example output earlier in the procedure, this URL is `tutorial-example-random-route.cfapps.io`.
6. In a browser, navigate to the app URL you recorded in a previous step.

## Custom Application Metrics

Click the buttons below to update custom metrics



The screen has the following buttons:

- **Increment Custom gauge:** Causes the `custom` metric to increase by a value of `1`. You use this button in [Trigger scaling](#).
- **Decrement custom gauge:** Causes the `custom` metric to decrease by a value of `1`.
- **See the metrics:** Opens </actuator/prometheus> in your browser. The Metric Registrar uses this page to collect metrics. You can view the values of the `custom` metric and all metrics from the Micrometer Prometheus library.
- **Increment Simple counter** and **Call an endpoint with high latency:** These buttons are not used in this tutorial. To learn about these functions, see [java-spring-security](#) on GitHub.

# Register a Custom App Metrics endpoint

When you want to your app to emit Custom App Metrics, you register the app as a metric source with the Metric Registrar.

To register a Custom App Metrics endpoint for the app:

1. Install the Metric Registrar CLI:

```
cf install-plugin -r CF-Community "metric-registrar"
```

2. Register the metrics endpoint of the `java-spring-security` app by running:

```
cf register-metrics-endpoint java-spring-security /actuator/prometheus --insecure
```

Because the app dependencies include the Micrometer Prometheus library, there is a metrics endpoint at `/actuator/prometheus`.



When you include the `--insecure` flag in the above command, the Metric Registrar scrapes the metrics endpoint on the default app port. Exposing metrics on the default app port makes the metrics available to anyone with access to the app. VMware recommends that you do not use the `--insecure` flag in a production environment. Instead, specify an alternative port by including the `--internal-port` flag. Specifying an alternative port the `--internal-port` flag exposes the metrics endpoint on that port and limits access to the app.

3. Install the Log Cache CLI by running:

```
cf install-plugin -r CF-Community "log-cache"
```

Log Cache is a component of TAS for VMs that caches logs and metrics from across the platform.

4. View the app metrics as they are emitted running this command. The `--follow` flag appends output as metrics are emitted.

```
cf tail java-spring-security --envelope-class metrics --follow
```

The output looks similar to the following example. The `custom` metric displays in the output.

```
Retrieving logs for app in org sandbox / space development as example@user...
```

```
2019-08-28T09:17:56.28-0700 [tutorial-example/1] GAUGE cpu:0.289158 percentage
disk:135716864.000000 bytes disk_quota:1073741824.000000 bytes
memory:399979315.000000 bytes memory_quota:2147483648.000000 bytes
2019-08-28T09:17:56.50-0700 [tutorial-example/0] GAUGE custom:1.000000
```

- In the `java-spring-security` app UI, you must click **Increment Custom gauge** at least one time to cause the app to emit the `custom` metric.

- If you do not see output similar to the previous example, the Metric Registrar might not exist in your TAS for VMs deployment. To verify this, consult the operator of your TAS for VMs deployment.

## Create an autoscaling rule

Autoscaler is integrated with Apps Manager. You can create autoscaling rules in Apps Manager.

To create an autoscaling rule for the `java-spring-security` app that uses the `custom` metric as its scaling metric:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. In Apps Manager, go to the `java-spring-security` app overview. For more information, see [View app overview](#) in *Managing Apps and Service Instances Using Apps Manager*.
3. Click **Autoscaling Deactivated**.

Processes and Instances								
web (Revision 1)					AUTOSCALING DEACTIVATED	SCALE		
Instances	1	Memory Allocated	2 GB	Disk Allocated	1 GB	Log Rate Allocated (per second)	16 KB	
#	Health	CPU Entitlement	Memory	Disk	Log Rate (per second)	Uptime		
>	0	Up	6%	177 MB	182 MB	0 B	1 min	⋮

1. Click **Activate Autoscaling**.
2. Under **Instance Limits and Scaling**, configure upper and lower scaling limits for the `java-spring-security` app:
  1. For **Minimum**, enter `1`.
  2. For **Maximum**, enter `5`.
  3. Click **Apply Changes**.

## x Manage Autoscaling

[Download Autoscaler CLI](#) ↗

**DEACTIVATE AUTOSCALING**

### INSTANCE LIMITS AND SCALING

Scale Up By  instance/instances at the same time

Scale Down By  instance/instances at the same time

Currently in use: 2

Minimum

Maximum

**APPLY CHANGES**

3. To create an autoscaling rule:

1. Next to **Scaling Rules**, click **Add Rule**. The **Add Rule** window appears.
2. From the **Rule Type** options, select **Custom App Metric**.
3. Click **Next**. More configuration text boxes appear.
4. For **Scale down if less than**, enter **2**. If the average value of the `custom` metric falls below this number, Autoscaler scales the number of app instances down.
5. For **Scale up if more than**, enter **5**. If the average value of the `custom` metric rises above this number, Autoscaler scales the number of app instances up.
6. For **Metric**, enter `custom`.
7. Click **Save**.

## < Add Rule

Apps scale by the default or configured scaling factor per event. Apps will scale up when any metric maximum is met and scale down only when all metric minimums are met.

### Custom App Metric

Custom metric for the app. Use Metric Registrar to configure your app to provide custom metrics.

Scale down, if less than	2	Scale up, if more than	5
<b>Metric</b>			
custom			
CANCEL	BACK	SAVE	

## Trigger scaling

Now that you pushed an app that emits a Custom App Metric and configured autoscaling rules, you can trigger a scaling action. App Autoscaler scales the app when the Custom App Metric goes above or below the threshold specified in the scaling rule.

To trigger scaling:

1. Navigate to the web UI of the app. Use the same URL from [Push the sample app](#).
2. Click **Increment Custom gauge** enough times to bring the Custom App Metric over the threshold of [5](#) that you set in the scaling rule. You can see the value of the `custom` metric using the **See Metrics** button.
3. Monitor the app page in Apps Manager for about two minutes. App Autoscaler begins to scale the app. It adds one instance at a time until it reaches the **Maximum** instance limit of [5](#).

## Next steps

Now that you have completed this tutorial, explore the app emitting Custom App Metrics and creating scaling rules with your own app. Review the resources listed in the Overview section to learn more. After you instrument your app to emit Custom App Metrics, you can follow the steps outlined in this tutorial to scale based on those metrics.

## Configuring scheduled limit changes

You can configure scheduled limit changes in App Autoscaler for apps in your TAS for VMs deployment.

## Overview of scheduled limit changes

When you create scaling limits for an app, you define the minimum and maximum number of instances that Autoscaler can create for an app. When you configure scheduled limit changes for an app, Autoscaler can change these scaling limits according to a schedule that you define.

VMware recommends that you configure scheduled limit changes when you can reasonably predict how many instances your apps require during any given period of time. The following list describes common use cases for scheduled limit changes:

- You can pre-emptively scale for an expected period of high traffic by increasing the upper scaling limit to a higher value than what Autoscaler might select based on the configured scaling metrics.
- You can reduce redundant resource usage during expected periods of low traffic by reducing the lower scaling limit during those periods.
- You can control resource usage during periods in which users can tolerate the effects of an overloaded app by reducing the upper scaling limit during those periods.

If you want to ensure that Autoscaler creates enough instances of an app to handle the amount of traffic that it receives at any given time, but the amount of traffic that the app receives is less predictable, you can change the scaling factors for the app. Setting a higher scale-up factor can help ensure that Autoscaler scales up quickly enough to sufficiently handle a high amount of traffic. For more information, see [Update scaling factors in Using the App Autoscaler CLI](#).

VMware recommends that you load-test your app to verify that the scheduled limit changes you configured are effective. For more information, see [Load-testing your App in Using Autoscaler in production](#).

## Configuring scheduled limit changes through the cf CLI

The procedures in this section describe how to configure scheduled limit changes for Autoscaler through the Cloud Foundry Command-Line Interface (cf CLI).

You can configure scheduled limit changes in the following ways:

- Using a manifest file. For more information, see [Configure scheduled limit changes using a manifest file](#).
- Using CLI commands. For more information, see [Configure scheduled Limit changes using CLI commands](#).

For the procedures in this section, you must use the App Autoscaler CLI plug-in. To download and install the App Autoscaler CLI plug-in, see [Install the App Autoscaler CLI plug-in](#) in *Using the App Autoscaler CLI*.

### Configure scheduled limit changes using a manifest file

You can configure scheduled limit changes declaratively through a manifest file. This manifest file only configures Autoscaler, and does not interfere with any other existing app manifest files in your TAS for VMs deployment.

To configure scheduled limit changes using a manifest file:

1. In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- **ORG-NAME** is the name of the org containing the space in which the app you want to scale is deployed.
  - **SPACE-NAME** is the name of the space in which the app you want to scale is deployed.
2. If the space in which the app you want to scale is deployed does not already have a service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
  - **SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance.
4. To create a manifest file for Autoscaler that configures a scheduled limit change, create a YAML file that includes the following configuration parameters:

```
instance_limits:
  min: LOWER-SCALING-LIMIT
  max: UPPER-SCALING-LIMIT
rules: []
scheduled_limit_changes:
- recurrence: RECURRENTNESS
  executes_at: "TIME"
  instance_limits:
    min: SCHEDULED-LOWER-SCALING-LIMIT
    max: SCHEDULED-UPPER-SCALING-LIMIT
```

Where:

- **LOWER-SCALING-LIMIT** is the minimum number of instances that you configured Autoscaler to create for the app by default.
- **UPPER-SCALING-LIMIT** is the maximum number of instances that you configured Autoscaler to create for the app by default.

- (Optional) `RECURRANCE` is the calculated value of the bitmask days of the week on which you want Autoscaler to re-apply the scheduled limit change. For more information, see [Calculating a recurrence schedule value](#).
  - `TIME` is the time, in UTC timestamp format, at which you want Autoscaler to apply the scheduled limit change. For example, `2032-01-01T20:00:00Z`. If the value that you configure for `TIME` is your local time converted to UTC time, and Daylight Saving Time is observed in your time zone, the UTC offset for your time zone might change during the year.
  - `SCHEDULED-LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is fewer than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances up to this number.
  - `SCHEDULED-UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is greater than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances down to this number.
5. Apply the manifest file you configured in the previous step to the app for which you want to configure scheduled limit changes by running:

```
cf configure-autoscaling APP-NAME MANIFEST-FILENAME
```

Where:

- `APP-NAME` is the name of the app.
- `MANIFEST-FILENAME` is the filename of the manifest file you created in the previous step.

For example, running the following applies the `autoscaler.yml` manifest file to `example-app`:

```
cf configure-autoscaling example-app autoscaler-manifest.yml.
```

The earlier command returns output similar to the following example:

```
Setting autoscaler settings for app example-app for org example-org / s
pace example-space as user
OK
```

## Calculating a recurrence schedule value

When you configure a recurring scheduled limit change for Autoscaler using a manifest file, Autoscaler uses the `recurrence` value and `executes at` value to set the date and time of the first occurrence of a scheduled limit change. Autoscaler then uses the `time` value to set the time of day for all subsequent scheduled limit changes.

Because Autoscaler bitmasks the days of the week in its recurrence schedule, you must calculate the correct value to enter for the `recurrence` property in your Autoscaler manifest file.

To calculate a `recurrence` value:

- Add together the bitmask values for each day of the week that you want Autoscaler to apply the scheduled limit change. The following table shows the bitmask values for each day of the week:

Day	Su	Mo	Tu	We	Th	Fr	Sa
Value	64	32	16	8	4	2	1

For example:

- To apply the scheduled limit change on weekdays, use the following calculation:  
 $32+16+8+4+2=62$ . In your Autoscaler manifest, the value of `recurrence` must be `62`.
- To apply the scheduled limit change on weekends, use the following calculation:  $64+1=65$ . In your Autoscaler manifest, the value of `recurrence` must be `65`.
- To apply the scheduled limit change every day, use the following calculation:  
 $64+32+16+8+4+2+1=127$ . In your Autoscaler manifest, the value of `recurrence` must be `127`.
- To apply the scheduled limit change on Monday, Wednesday, and Friday, use the following calculation:  $32+8+2=42$ . In your Autoscaler manifest, the value of `recurrence` must be `42`.

The following example manifest configures Autoscaler to scale the number of app instances down every Friday at 8 PM UTC, then scale them back up every Monday at 4 AM UTC:

```
---
...
scheduled_limit_changes:
- recurrence: 32
  executes_at: "2032-01-01T20:00:00Z"
  instance_limits:
    min: 1
    max: 3
- recurrence: 2
  executes_at: "2032-01-01T04:00:00Z"
  instance_limits:
    min: 6
    max: 12
```

## Configure scheduled limit changes using CLI commands

To configure scheduled limit changes using CLI commands:

- In a terminal window, target the space in which the app you want to scale is deployed by running:

```
cf target -o ORG-NAME -s SPACE-NAME
```

Where:

- `ORG-NAME` is the name of the org containing the space in which the app you want to scale is deployed.
- `SPACE-NAME` is the name of the space in which the app you want to scale is deployed.

- If the space in which the app you want to scale is deployed does not already have a service instance of Autoscaler deployed in it, create an Autoscaler service instance by running:

```
cf create-service app-autoscaler PLAN-NAME SERVICE-INSTANCE-NAME
```

Where:

- **PLAN-NAME** is the name of the service plan you want to use for the Autoscaler service instance.
- **SERVICE-INSTANCE-NAME** is the name you want to give the Autoscaler service instance. For example, `autoscaler`.

If there is already an Autoscaler service instance in the space in which the app you want to scale is deployed, skip this step.

3. Bind the Autoscaler service instance to the app you want to scale by running:

```
cf bind-service APP-NAME SERVICE-INSTANCE-NAME
```

Where:

- **APP-NAME** is the name of the app you want to scale.
- **SERVICE-INSTANCE-NAME** is the name of the Autoscaler service instance.

4. Configure upper and lower scaling limits for the app by running:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- **APP-NAME** is the name of the app.
- **LOWER-SCALING-LIMIT** is the minimum number of instances you want Autoscaler to create for the app.
- **UPPER-SCALING-LIMIT** is the maximum number of instances you want Autoscaler to create for the app.

5. Allow Autoscaler to begin making scaling decisions for the app by running:

```
cf enable-autoscaling APP-NAME
```

Where **APP-NAME** is the name of the app.

6. Create a scheduled limit change by running:

```
cf create-autoscaling-slc APP-NAME TIME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
--recurrence DAY-1,DAY-2,DAY-3
```

Where:

- **APP-NAME** is the name of the app.
- **TIME** is the time, in UTC timestamp format, at which you want Autoscaler to apply the scheduled limit change. For example, `2032-01-01T20:00:00Z`. If the value that you configure for **TIME** is your local time converted to UTC time, and Daylight Saving Time is observed in your time zone, the UTC offset for your time zone might change during the year.

- `LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is fewer than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances up to this number.
- `UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app during the scheduled limit change. If the current number of app instances is greater than this number at the time of the scheduled limit change, Autoscaler scales the number of app instances down to this number.
- (Optional) Include the `--recurrence` parameter to specify the days of the week on which you want Autoscaler to re-apply the scheduled limit change, where `DAY-1`, `DAY-2`, `DAY-3`, and so on are the days you want to specify. Valid values are `Mo`, `Tu`, `We`, `Th`, `Fr`, `Sa`, or `Su`. For example, if you want Autoscaler to re-apply the scheduled limit change on Monday, Wednesday, Friday, and Saturday, include `--recurrence Mo,We,Fr,Sa` in the command.

## Configuring scheduled limit changes through Apps Manager

To configure scheduled limit changes through Apps Manager, see [Create or edit scheduled limit changes in Scaling an App Using App Autoscaler](#).

## Reviewing autoscaling events for scheduled limit changes

When Autoscaler applies a scheduled limit change, it records an autoscaling event. If the current number of app instances is under the lower scaling limit of the scheduled limit change, Autoscaler scales the number of app instances up to the lower scaling limit and records a separate autoscaling event.

You can review the autoscaling events that Autoscaler records for scheduled limit changes in the following ways:

- Through the cf CLI. For more information, see [Review autoscaling events for scheduled limit changes through the cf CLI](#).
- Through Apps Manager. For more information, see [Review autoscaling events for scheduled limit changes through Apps Manager](#).

## Review autoscaling events for scheduled limit changes through the cf CLI

To review the autoscaling events that Autoscaler records for scheduled limit changes through the cf CLI:

1. In a terminal window, run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of the app for which you want to review autoscaling events.

If Autoscaler has recorded autoscaling events for scheduled limit changes, the above command returns output that contains autoscaling events similar to the following example:

Time	Description
2022-05-26T21:32:17Z	Scaling from 10 to 20 instances: app below minimum instance limit
2022-05-26T21:31:50Z	Rule Applied: Scaling Limits set to 20 to 100 instances

## Review autoscaling events for scheduled limit changes through Apps Manager

To review the autoscaling events that Autoscaler records for scheduled limit changes through Apps Manager:

1. Log in to Apps Manager. For more information, see [Logging in to Apps Manager](#).
2. Select the org that contains the space in which the app you want to scale is deployed.
3. Select the space in which the app you want to scale is deployed.
4. Under **Processes and Instances**, click **Autoscaling Activated**.
5. Under **Event History**, click **View More**. A list of autoscaling events appears. If Autoscaler has recorded autoscaling events for scheduled limit changes, the list of autoscaling events includes events similar to the following example:

Scaling from 10 to 20 instances: app below minimum instance limit
Rule Applied: Scaling Limits set to 20 to 100 instances

## Using App Autoscaler in production

When using Autoscaler to scale an app in a production environment, you must consider your goals for the app.

You might want your app to be capable of processing a certain number of business transactions per second. Each of those transactions might be comprised of multiple HTTP requests to the app itself and to services and other apps in your TAS for VMs deployment. With this number of HTTP requests, you can determine how many instances of each app are necessary to process your wanted number of business transactions per second. You can use this information to create effective autoscaling rules with Autoscaler.

## Autoscaling limits

The autoscaling limits for an app are the upper and lower limits for the number of instances Autoscaler can create for that app. The lower scaling limit is the minimum number of instances to which Autoscaler can scale an app down, and the upper scaling limit is the maximum number of instances to which Autoscaler can scale an app up. Setting appropriate upper and lower scaling limits ensures that Autoscaler does not create too few or too many app instances.

Apps often have dependencies on an external app or service that can constrain Autoscaler's ability to scale app instances effectively. Because of this, scaling instances up past a certain number might not address problems you encounter until you address issues within those dependencies. For example, if all of your app instances use a single shared MySQL service instance, scaling the number of instances up might cause

them to reach the maximum number of connections allowed by MySQL. You must address this constraint before you can scale your app further.

VMware recommends load-testing your app to confirm that you have set appropriate scaling limits before pushing the app to a production environment. For more information, see [Load-testing your app](#).

## Configure autoscaling limits

To configure the upper and lower scaling limits for an app:

1. In a terminal window, run:

```
cf update-autoscaling-limits APP-NAME LOWER-SCALING-LIMIT UPPER-SCALING-LIMIT
```

Where:

- `APP-NAME` is the name of the app for which you want to configure autoscaling limits.
- `LOWER-SCALING-LIMIT` is the minimum number of instances you want Autoscaler to create for the app.
- `UPPER-SCALING-LIMIT` is the maximum number of instances you want Autoscaler to create for the app.

To set the lower scaling limit for `example-app` to `20` and the upper scaling limit to `100`, run:

```
cf update-autoscaling-limits example-app 20 100
```

## Resource quotas

Each space and org in a TAS for VMs deployment has a quota plan that defines memory, service, and instance usage quotas for all apps and services deployed in them. For example, a quota plan for a space can set up to 10 services, 10 routes, and 2 GB of RAM, while a quota plan for an org might allow up to 100 services, 100 routes, and 10 GB of RAM.

When setting autoscaling limits for Autoscaler, you must ensure that the resource quotas allocated to the app are sufficient for Autoscaler to scale the app within those limits. If the resource quotas that are available for the app to use are lower than the resources required to meet the upper scaling limit you set, Autoscaler cannot scale up to that upper scaling limit.

You can create quota plans for spaces and orgs. If you do not have permissions to create quota plans or you need an existing resource quota limit increased, contact the operator for your TAS for VMs deployment.

When defining resource quotas for a space or org, you must consider not only the scaling needs of an individual app, but the potential scaling needs of other apps in the same space or org.

For more information about creating and editing quota plans for spaces and orgs, see [Creating and modifying quota plans](#).

## Reviewing space and org quota plans

For Autoscaler to scale the number of app instances up to the upper scaling limit you configure, the quota plans for both the space and org must have enough of the following resources available for the app to use:

- **App Instances:** The number of instances allotted per app.

- **Total Memory:** The total amount of memory allotted for all app instances in the space or org.
- **Instance Memory:** The amount of memory allotted per app instance.

If your app is configured with a memory limit of 1 G per app instance, and the upper scaling limit you configured is 20 app instances, 20 G of memory must be available in your space or org quota plan. Otherwise, Autoscaler cannot scale the app up to the upper scaling limit.

When an app reaches a resource quota limit for the space or org in which it is deployed, Autoscaler does not record an autoscaling event. You can review the quota plans for the space or org to find out if an app has reached a resource quota limits.

For more information about reviewing space and org quota plans, see [Space or org quota is reached in Troubleshooting App Autoscaler](#).

## Setting per-app limits

You can adjust the resource limits for individual apps. If an app is allocated significantly more RAM than it requires per app instance, Autoscaler can create more app instances using the same number of resources.



In a TAS for VMs deployment, the amount of memory allocated to an app instance determines the number of CPU shares available to it. Reducing the amount of memory allocated to an app instance also reduces its CPU shares.

To set resource limits for individual apps, you can deploy your apps with app manifests or vertically scale them using the Cloud Foundry Command-Line Interface (cf CLI). For more information about app manifests, see [App manifest attribute reference](#). For more information about vertically scaling an app, see [Scaling vertically](#) in [Scaling an App Using cf scale](#).

## Scaling metrics

You can define rules for Autoscaler to scale your app instances up or down using a particular scaling metric.

Initially, VMware recommends that you define a single autoscaling rule using a scaling metric such as **HTTP Request Latency** or **RabbitMQ Queue Depth**. At a later time, it might be appropriate to define more than one autoscaling rule for the same app.

These are two of the default scaling metrics you can select when you define an autoscaling rule for an app:

- **HTTP Request Latency:** Use this scaling metric if your app receives HTTP requests directly from the Gorouter, and you want to scale the number of app instances up as the average latency of the requests increases. Before choosing this metric as your scaling metric, consider whether scaling your app might increase HTTP Request Latency. If additional app instances must use the same external resource, such as a MySQL service instance or another app, this might increase HTTP Request Latency. If Autoscaler scales the number of app instances up, and HTTP Request Latency is still over the maximum metric threshold you configured because all app instances rely on the same external resource, Autoscaler continues to create more app instances to no effect.
- **RabbitMQ Queue Depth:** Use this scaling metric if your app reads messages from a RabbitMQ queue, and you want to scale the number of app instances up to read messages from the RabbitMQ queue more quickly.

You can create custom autoscaling rules using other metrics.

If your app deployment is comprised of multiple TAS for VMs apps, consider using the same scaling metric for each app. Using the same scaling metric across all of the apps that are part of your app deployment can help you to understand the scaling behavior and needs of your app deployment.



If the autoscaling metric thresholds you configured are too low, scaling the number of app instances up might not be enough to bring the scaling metric back below the maximum metric threshold.

To define autoscaling rules for Autoscaler, see:

- [Add or delete scaling rules](#) in *About App Autoscaler*
- [Create an autoscaling rule](#) in *Using the App Autoscaler CLI*.

For more information about the scaling metrics you can use when defining autoscaling rules for Autoscaler, see:

- [Default metrics for scaling rules](#)
- [Custom App Metrics for scaling rules](#) in *About App Autoscaler*.

## Autoscaler and C2C networking

Autoscaler can only use **HTTP Request Latency** and **HTTP Request Throughput** as a scaling metric for apps that receive requests directly through the Gorouter. Autoscaler does not support using these two metrics for apps that receive requests from other apps through container-to-container (C2C) networking or TCP routers.

If your app relies on back-end HTTP services that apps in your TAS for VMs deployment must access through C2C networking, the Gorouter does not generate HTTP events for those requests. As a result, Autoscaler cannot scale those HTTP services. For Autoscaler to scale them, you must either use a different default scaling metric or create a custom scaling metric for them.

## Scaling factors

You can define scale-up and scale-down factors to control how quickly Autoscaler scales app instances in each direction. For example, when you configure an app with a scale-up factor of [20](#) and a scale-down factor of [10](#), Autoscaler scales the number of app instances up by 20 instances at a time and down by 10 instances at a time.

When you define a larger scale-up factor for an app, Autoscaler scales the number of app instances up more quickly in response to the scaling metric you defined reaching its maximum metric threshold.

Because of this, using a particular scaling metric for the app might cause or exacerbate performance issues for the app in some circumstances. If networking issues or an unresponsive downstream service causes greater HTTP Request Latency, configuring Autoscaler to scale app instances up by a larger number might cause HTTP Request Latency to worsen even more.

In many production deployments, the scale-down factor for an app is lower than the scale-up factor. This helps an app to scale up, then return to an earlier baseline number of instances more slowly by stepping down in smaller increments. You might want to configure a lower scale-down factor if you do not want Autoscaler to scale the number of app instances down too quickly, and you are less concerned about freeing up resources.

## Configure scaling factors

To configure scaling factors for an app:

1. In a terminal window, run:

```
cf update-autoscaling-factors APP-NAME SCALE-UP-FACTOR SCALE-DOWN-FACTOR
```

Where:

- **APP-NAME** is the name of the app for which you want to configure scaling factors.
- **SCALE-UP-FACTOR** is the number of app instances by which you want Autoscaler to scale up at a time.
- **SCALE-DOWN-FACTOR** is the number of app instances by which you want Autoscaler to scale down at a time.

To configure Autoscaler to scale `example-app` up by 20 instances at a time and down by 10 instances at a time, run:

```
cf update-autoscaling-factors example-app 20 10
```

## Load-testing your app

To ensure that you have configured effective autoscaling for an app, VMware recommends that you load-test the app. Load testing demonstrates that Autoscaler scales the number of app instances as expected when the scaling metric you define for the app increases or decreases.

To load test an app effectively, you must do so in an environment that is as similar to your production deployment as possible.

Before you begin load-testing an app, you can plan your load test with the operator or team that operates your TAS for VMs deployment. This ensures that they are accepting of and can plan for the load you intend to generate. Additionally, VMware recommends working with the operator or team that operates your TAS for VMs deployment during your load test, because load testing can sometimes reveal performance issues within your TAS for VMs deployment.

The next sections provide more information about load testing to confirm the efficacy of Autoscaler for an app.

## Generating load and monitoring scaling events

There are a variety of tools you can use for load-testing. The method that you use for generating load varies based on both the load-testing tool you use and the scaling metric that you define for the app, because you must generate load that causes the scaling metric to fluctuate. For example, you might generate HTTP requests for apps that use HTTP Request Latency as their scaling metric, or you might generate RabbitMQ messages for apps that use RabbitMQ queue depth as their scaling metric.

VMware recommends incrementally increasing the load you generate for an app. With each increase, you can see whether Autoscaler is scaling the number of app instances as expected by monitoring the autoscaling events that Autoscaler records.

To monitor the autoscaling events that Autoscaler records as it scales an app:

1. In a terminal window, run:

```
cf autoscaling-events
```

## Confirming metric values from Autoscaler

For some scaling metrics, you can verify whether Autoscaler is using the correct metric values by comparing the load that your load-testing tool generates to the metric values that Autoscaler records. If these two values are not the same, such as if Autoscaler reports a lower number of requests per second than your load-testing tool generated, this might indicate that you must further scale TAS for VMs components on which Autoscaler relies.

For more information about TAS for VMs components you can scale to better support Autoscaler, see [Operating Autoscaler](#).

## Confirming scaling efficacy

To test each autoscaling step, verify that:

- Autoscaler records when a scaling metric has crossed the maximum metric threshold
- Verify that Autoscaler scaled the number of app instances up
- Creating more app instances brings the scaling metric back to the maximum metric threshold

If Autoscaler continues to scale app instances up, but the increased number of app instances does not bring the scaling metric back to below the maximum metric threshold, another part of your TAS for VMs deployment might be experiencing issues that are causing the value of the scaling metric to remain above the maximum metric threshold. You can identify and troubleshoot the issue by monitoring the app or working with the operator or team that operates your TAS for VMs deployment.

## Operating App Autoscaler

When scaling app instances using App Autoscaler, here is what you must consider for your TAS for VMs deployment.

Autoscaler can ensure that an app always has the number of instances it needs to handle the amount of traffic that it receives. However, in order for Autoscaler to create more app instances, you must ensure that TAS for VMs is sufficiently scaled.

Using Autoscaler to scale your apps might cause the workload that your TAS for VMs deployment manages to fluctuate more widely and often. As a result, provisioning resources for a TAS for VMs deployment that includes Autoscaler is more challenging than provisioning resources for a TAS for VMs deployment in which apps are static or scaled manually.

## Diego Cells

Before you configure Autoscaler to scale your apps, you must ensure that your Diego Cells have enough resources to meet the autoscaling demands of your apps. To ensure that your Diego Cells can accommodate autoscaling, VMware recommends monitoring the total available memory, total available disk, and available free chunks across all Diego Cells in your TAS for VMs deployment.

Using observability tools such as Healthwatch for VMware Tanzu and VMware Tanzu Observability by Wavefront can help you monitor the resources that your Diego Cells use and alert you if your Diego Cells are likely to run out of resources. For more information, see the [Healthwatch documentation](#) and the [Wavefront documentation](#).

## Resource quotas

Quota plans ensure that inefficient autoscaling rules or malicious requests do not cause Autoscaler to scale beyond the capabilities of your TAS for VMs deployment. You cannot configure Autoscaler to scale apps without ensuring that the space and org in which your app is deployed have quota plans that can accommodate your autoscaling needs.

When configuring Autoscaler to scale an app, you must ensure that the resource quotas allocated to the app are sufficient so Autoscaler can scale the app within the limits you configure. If the resource quotas that are available for the app to use are lower than the resources required to meet the upper scaling limit you configured, Autoscaler cannot scale up to that upper scaling limit.

For more information about creating and editing quota plans for your TAS for VMs deployment, see [Creating and modifying quota plans](#).

## Platform capacity

When creating or changing quota plans for a space or org in your TAS for VMs deployment, consider whether you want to provision more or fewer resources for the apps you want Autoscaler to scale.

The following descriptions of each scenario include their benefits and drawbacks:

- You can provision enough resources to set all apps to use their maximum allocated resource quotas simultaneously. However, you risk over-provisioning resources for your TAS for VMs deployment.
- You can provision fewer resources, you can provision more Diego Cells from the IaaS on which your VMware Tanzu Operations Manager foundation is deployed if you require them. However, you risk Autoscaler being unable to accommodate scaling requests.

## Apps that reach resource quotas

You might have already configured Autoscaler to scale some apps. However, if the scaling metric you configured Autoscaler to use for an app indicates that the number of app instances needs to be scaled up, but Autoscaler cannot scale the number of instances up further, the app might have reached its allocated quota limit for one or more resources.

Autoscaler does not record when resource quota limits prevent it from scaling an app. However, you can see when this occurs by configuring verbose logging for Autoscaler. To configure verbose logging for Autoscaler, see [Configure verbose logging for Autoscaler](#).

### Configure verbose logging for Autoscaler

To configure verbose logging for Autoscaler:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the **VMware Tanzu Application Service** tile.

3. Select **App Autoscaler**.
4. Activate the *Allow verbose logging\** check box.
5. Click **Save**.
6. Return to the Tanzu Operations Manager Installation Dashboard.
7. Click **Review Pending Changes**.
8. Under the **VMware Tanzu Application Service** tile, click **Errands**. The **Errands** menu expands.
9. Ensure that the **App Autoscaler Errand** check box is selected.
10. Click **Apply Changes**.

Deploying TAS for VMs again briefly interrupts Autoscaler processes.

After you deploy TAS for VMs again, you can review the verbose logs for Autoscaler to identify which apps have reached one or more of their allocated resource quota limits. To identify these apps, see [Identify apps that have reached resource quota limits](#).

#### Identify apps that have reached resource quota limits

To identify which apps have reached one or more of their allocated resource quota limits:

1. In a terminal window, run:

```
cf target -o system -s autoscaling
```

2. View the verbose logs for Autoscaler by running:

```
cf logs autoscale
```

If any apps have reached one or more of their allocated resource quota limits, the earlier command returns output that contains logs similar to the following example:

```
2019-10-18T12:40:58.19-0400[APP/PROC/WEB/0] OUT time="2019-10-18T16:40:58Z" level=info msg="Unable to scale. App instance quota has been reached. for app e59357x1-395a-4mp7-le36-ffbf4ec3de04 in space 9482047e-5x58-7a2m-p25l-es1w19o44b9a"
```

3. Record the global unique identifiers (GUIDs) for the apps and spaces that you identified in the earlier step. For example, in the example output in the previous step, the GUID for the app is `e59357x1-395a-4mp7-le36-ffbf4ec3de04`, and the GUID for the space is `9482047e-5x58-7a2m-p25l-es1w19o44b9a`.
4. Send a `GET` request to the Cloud Controller API to learn more about the resource quotas allocated to the apps and spaces you identified in a previous step.
  - To review the resource quotas allocated to an app, run:

```
cf curl /v3/apps/APP-GUID
```

Where `APP-GUID` is the GUID for the app that you recorded in the previous step.

- To review the resource quotas allocated to a space, run:

```
cf curl /v3/spaces/SPACE-GUID
```

Where `SPACE-GUID` is the GUID for the space that you recorded in the previous step.

## Traffic patterns of existing apps

If you are adding autoscaling to an existing app, VMware recommends that you review historical request traffic patterns for the app to determine how many app instances are necessary to sufficiently handle future request traffic.

For example, if the overall app traffic follows a natural pattern, such as increased traffic during the local business day, review historical request traffic patterns for the app to see the following:

- When the largest number of requests occurs each day.
- The current static number of app instances that are necessary to accommodate the largest number of requests.

The number of app instances needed to accommodate app traffic outside of peak hours might be significantly lower than the number of app instances needed to accommodate app traffic during peak hours. In cases like this, VMware recommends configuring Autoscaler for your app to avoid using resources when the app does not need them to accommodate the maximum amount of expected traffic.

## Log cache

Autoscaler scales the number of app instances based primarily on the metric envelopes it receives from Log Cache. To ensure that Log Cache can support Autoscaler, you must ensure that Log Cache can store enough metric envelopes that Autoscaler can make appropriate scaling decisions.

By default, Log Cache can store a maximum of 100,000 envelopes per app. Because TAS for VMs generates several envelopes for every request, and Log Cache stores recent app logs in the same bucket, the history that Log Cache stores for busy apps might be insufficient for Autoscaler to make appropriate scaling decisions.

To view the number of envelopes that Log Cache stores and the cache duration for an app:

1. Download the Log Cache of CLI plug-in from the [Log Cache of CLI Plugin](#) repository on GitHub.
2. In a terminal window, run:

```
cf log-meta --source-type application
```

The earlier command returns output similar to the following example:

Source ID	Source		
Source Type	Count	Expired	Cache Duration
e2xa9m8p-28l4-4ebf-8408-0548c8573c66	example-app-1		
application	82142	79749	21h54m48s
8e3798xa-7m2p-40l6-9605-e7cae998b855	example-app-2		
application	21040	23694	21h54m47s

3. Review the values in the `Count` and `Cache Duration` columns to view the number of envelopes that Log Cache stores and the cache duration for an app.

If necessary, you can increase the maximum number of envelopes that Log Cache can store per app by configuring the **Maximum number of envelopes stored in Log Cache per source** text box in the **Advanced Features** pane of the TAS for VMs tile. To configure the maximum number of envelopes that Log Cache can store, see [Maximum number of envelopes stored in Log Cache per source](#) in *Configuring TAS for VMs*.

Additionally, Log Cache might eject envelopes if it has an insufficient amount of memory. To fix this issue, you can scale Log Cache horizontally or vertically. To scale Log Cache horizontally or vertically, see [Scaling an app using cf scale](#).

Apps that use scaling metrics that are emitted less frequently, such as container metrics, are more likely to be affected by Log Cache evicting envelopes.

## Using debug logs for App Autoscaler

You can monitor App Autoscaler and its supporting VMware Tanzu Application Service for VMs (TAS for VMs) components through debug logging.

### Debug logging in Autoscaler

Autoscaler does not record debug logs by default. When you configure Autoscaler to record debug logs, the list of logs that Autoscaler records includes debug logs with its normal logs. Debug log entries include `DEBUG`.

You can use the debug logs that Autoscaler generates to:

- See whether developers of your apps are using Autoscaler to scale them, and measure the efficacy of apps that use Autoscaler. For more information, see [Reviewing Autoscaler use](#).
- Verify that if TAS for VMs components are failing to sufficiently support Autoscaler. For more information, see [Failure modes](#).

To configure Autoscaler to record debug logs, see [Configure debug logging for Autoscaler](#). To review the debug logs for Autoscaler, see [Review Autoscaler debug logs](#).

## Configure debug logging for Autoscaler

To configure Autoscaler to record debug logs:

1. In a terminal window, run:

```
cf target -o system -s autoscaling
```

2. Set the logging level for Autoscaler to `debug` by running:

```
cf set-env autoscale LOG_LEVEL debug
```

3. Restart Autoscaler by running:

```
cf restart autoscale
```



Starting Autoscaler again briefly interrupts any processes it is performing.

## Review Autoscaler debug logs

To review the debug logs for Autoscaler:

1. In a terminal window, run:

```
cf target -o system -s autoscaling
```

2. Run:

```
cf logs autoscale
```

In the terminal output, all logs for Autoscaler appear, including debug logs. Debug logs include `DEBUG` in their log entries.

## Reviewing Autoscaler use

As an operator, you can use debug logs to see whether developers of your apps are using Autoscaler to scale them, and you can measure the efficacy of apps that use Autoscaler.

If you configured Autoscaler correctly, it logs the following metrics:

- `autoscale.scale_up`: The number of times Autoscaler has scaled an app up.
- `autoscale.scale_down`: The number of times Autoscaler has scaled an app down.
- `autoscale.enabled_bindings`: The number of Autoscaler service bindings created.



These metrics appear as log entries and are not emitted to Loggregator.

To view these metrics, see [Review Autoscaler debug logs](#).

You can use one of the following methods to identify which apps are using Autoscaler:

- You can review the overall number of running app instances that Diego reports for each Diego Cell to measure how many app instances are running at any given time. For more information, see [Running app instances, rate of change](#) in *Key Performance Indicators*.
- You can use `cf curl` to retrieve information about Autoscaler service instances from the Cloud Foundry API (CAPI). To identify apps that are using Autoscaler through CAPI, see [Retrieve Autoscaler service instances from CAPI endpoints](#).

Because each team of developers might use different autoscaling rules for their apps, it might be difficult to accurately verify how effectively Autoscaler scales each app. However, you can gain a generalized understanding of the effect that Autoscaler has on the apps it scales by comparing the number of running app instances with other scaling metrics that the developers of your apps might be using. For more information about various scaling metrics you can use in your comparison review, see [Key Performance Indicators](#).

## Retrieve Autoscaler service instances from CAPI endpoints

To identify apps that are using Autoscaler through CAPI:

1. In a terminal window, retrieve the global unique identifier (GUID) of the service plan for Autoscaler by running:

```
cf curl /v3/service_plans/:guid
```

In the output for this command, the value of `guid` is the GUID of the service plan for Autoscaler. For more information, see the [CAPI documentation](#).

2. Record the value of `guid` you retrieved earlier in this procedure.
3. Retrieve information about apps that are using Autoscaler using one of the following methods:
  - o Retrieve a list of the names of Autoscaler service instances by running:

```
cf curl /v3/service_plans?service_offering_names=app-autoscaler | jq -r '.resources[] | .guid' SERVICE-PLAN-GUID
```

Where `SERVICE-PLAN-GUID` is the GUID of the service plan for Autoscaler that you recorded earlier in this procedure. For more information, see the [CAPI documentation](#).

To run this command, you must have jq installed. To install jq, see the [jq website](#).

- o Retrieve a list of the GUIDs of Autoscaler service instances by running:

```
cf curl '/v3/service_instances?service_plan_guids=SERVICE-PLAN-GUID'
```

Where `SERVICE-PLAN-GUID` is the GUID of the service plan for Autoscaler that you recorded earlier. For more information, see the [CAPI documentation](#).

## Failure modes

Rather than always maintaining enough app instances to handle the maximum amount of traffic that you expect for your apps, you can use Autoscaler to provision only the number of instances that your apps require to handle the amount of traffic that you expect at any given time. However, if Autoscaler or the TAS for VMs components that support Autoscaler fail, Autoscaler cannot scale the number of app instances up enough to meet the needs of your apps.

If you are not using Autoscaler, TAS for VMs component failures might have little impact on your apps. Because Autoscaler depends on TAS for VMs components such as Log Cache, the Cloud Controller, and MySQL to scale apps, using Autoscaler greatly increases the impact of TAS for VMs component failures on those apps.

This section describes some of the ways in which the TAS for VMs components that support Autoscaler might fail, with examples of the debug log metrics, autoscaling events, and errors in Autoscaler debug logs that might appear when these TAS for VMs components fail.

### Log cache

Autoscaler depends heavily on Log Cache, which provides the majority of metrics that Autoscaler uses to verify when to scale an app. If Log Cache fails or is insufficiently scaled, Autoscaler might not retrieve metrics, so it cannot determine when to scale an app.

If you configured Autoscaler correctly, it logs the following metrics:

- `autoscale.logcache.read_errors`: Errors that Autoscaler encounters when reading from Log Cache.
- `autoscale.logcache_metric_fetch_duration`: The time Autoscaler takes to retrieve metrics from Log Cache.

These metrics appear as log entries and are not emitted to Loggregator.

To view these metrics, see [Review Autoscaler debug logs](#).

For more information about Log Cache, see [Logging and metrics architecture](#).

### Log cache gateway is unavailable

When Autoscaler cannot connect to the Log Cache gateway, you see an autoscaling event similar to the following example:

```
Autoscaler did not receive any metrics for memory during the scaling window.  
Scaling down is deferred until these metrics are available.
```

You also see an error similar to the following example in the debug logs for Autoscaler:

```
[APP/PROC/WEB/2] OUT logcache walker: unexpected status code 502
```

To view autoscaling events for an app, see [View autoscaling events](#) in *Using the App Autoscaler CLI*. To review Autoscaler debug logs, see [Review Autoscaler debug logs](#).

### Individual log cache instance fails

Log Cache holds the log and metric envelopes for an app on a single Log Cache instance. When that Log Cache instance fails, Autoscaler cannot retrieve those envelopes, so it cannot verify when to scale an app.

When the Log Cache instance that holds the envelopes for an app fails, you see an autoscaling event similar to the following example:

```
Autoscaler did not receive any metrics for memory during the scaling window.  
Scaling down is deferred until these metrics are available.
```

You also see an error similar to the following example in the debug logs for Autoscaler:

```
[APP/PROC/WEB/1] OUT logcache walker: unexpected status code 503
```

To view autoscaling events for an app, see [View autoscaling events](#) in *Using the App Autoscaler CLI*. To review Autoscaler debug logs, see [Review Autoscaler debug logs](#).

### Log cache instances are unresponsive

When Log Cache instances do not respond to requests from Autoscaler, you see an autoscaling event similar to the following example:

Autoscaler did not receive any metrics for memory during the scaling window. Scaling down is deferred until these metrics are available.

You also see an error similar to the following example in the debug logs for Autoscaler:

```
[APP/PROC/WEB/2] OUT logcache walker: Get "https://log-cache.sys.example.com/api/v1/read/85a6aff3-c739-4364-8df3-44f1aa50662b": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
```

To view autoscaling events for an app, see [View event history in Scaling an App Using App Autoscaler](#) or [View autoscaling events in Using the App Autoscaler CLI](#). To review Autoscaler debug logs, see [Review Autoscaler debug Logs](#).

## Cloud Controller

Autoscaler reads the app metadata that the Cloud Controller stores to discover how many instances an app has running. When Autoscaler scales the number of app instances up or down, it sends a request to the Cloud Controller. Then, the Cloud Controller directs the Diego Cell that runs the app to stage the number of app instances that Autoscaler has requested.

Autoscaler also uses the Cloud Controller to retrieve the credentials stored in RabbitMQ service bindings. Autoscaler uses these credentials to read the metadata for RabbitMQ queues.

The Cloud Controller also authorizes Log Cache to provide log and metric envelopes to Autoscaler.

If you configured Autoscaler to record debug logs, Autoscaler logs the following metrics:

- `autoscale.cloud_controller.calls`: The number of requests that Autoscaler has made to the Cloud Controller.
- `autoscale.cloud_controller.request_errors`: The number of requests that Autoscaler has made to the Cloud Controller that resulted in an error.
- `autoscale.cloud_controller.scale_errors`: The number of requests to scale an app that have resulted in an error.

These metrics appear as log entries and are not emitted to Loggregator.

To view these metrics, see [Review Autoscaler debug logs](#).

For more information about the Cloud Controller, see [Cloud Controller](#).

### Quota has been reached

When scaling causes the application to exceed a quota, you see an autoscaling event similar to the following example:

```
Unable to scale. App instance quota has been reached
```

### Cloud Controller API is stopped

When the Cloud Controller API is stopped, you see an autoscaling event similar to the following example:

```
Unable to scale due to Cloud Controller error.
```

To discover the cause of this error, see [Autoscaler Error "Unable to scale due to Cloud Controller error"](#).

You also see an error similar to the following example in the debug logs for Autoscaler:

```
[APP/PROC/WEB/0] OUT level=error msg="[Cloud Controller - app summary] CloudController - route not found"
```

To view autoscaling events for an app, see [View autoscaling events](#) in *Using the App Autoscaler CLI*. To review Autoscaler debug logs, see [Review Autoscaler debug logs](#).

### Cloud Controller is unresponsive

When the Cloud Controller does not respond to requests from Autoscaler or Log Cache, you see an autoscaling event similar to the following example:

```
Unable to scale due to Cloud Controller error.
```

To discover the cause of this error, see [Autoscaler Error "Unable to scale due to Cloud Controller error"](#).

You also see an error similar to the following example in the debug logs for Autoscaler:

```
[APP/PROC/WEB/0] OUT level=error msg="[Cloud Controller - app summary] failure connecting to Cloud Controller. Error: Get \"https://apisys.example.com/v2/apps/85a6aff3-c739-4364-8df3-44f1aa50662b/summary\": context deadline exceeded (Client.Timeout exceeded while awaiting headers)"
[APP/PROC/WEB/1] OUT level=error msg="[Cloud Controller - app summary] Cloud Controller- Failure"
```

To view autoscaling events for an app, see [View autoscaling events](#) in *Using the App Autoscaler CLI*. To review Autoscaler debug logs, see [Review Autoscaler debug logs](#).

## MySQL

Autoscaler uses a MySQL database to store persistent information about Autoscaler service bindings and the autoscaling rules you configure. If Autoscaler fails to select from or update the MySQL database, Autoscaler cannot scale your apps.

You see an error similar to the following example in the debug logs for Autoscaler:

```
[APP/PROC/WEB/0] OUT level=error msg="Unable to find any enabled service bindings by instance id" error="driver: bad connection" instance_id=0
[APP/PROC/WEB/2] ERR [mysql] packets.go:37: unexpected EOF
```

To review Autoscaler debug logs, see [Review Autoscaler debug logs](#).

## Troubleshooting App Autoscaler

Troubleshoot when App Autoscaler fails to properly scale apps for your TAS for VMs deployment.

### Autoscaler fails to scale an app when expected

This section describes possible causes for Autoscaler failing to scale an app as you expect in your VMware Tanzu Application Service for VMs (TAS for VMs) deployment. To determine the cause, see the following sections.

## Scaling threshold not reached

Confirm that you configured the autoscaling rules for the app to respond as you expect to the traffic that the app is receiving. For example, when you use RabbitMQ queue depth as your scaling metric, you can compare the metrics that VMware Tanzu RabbitMQ for VMs (RabbitMQ) emits for the specified queue to the autoscaling rules you configured. If the autoscaling rules are not configured as you expect, you can adjust them accordingly.

## Metrics average over collection interval is too low

Autoscaler averages metrics over the metric collection interval you configure in the **App Autoscaler** pane of the TAS for VMs tile.

If the values of the scaling metric for an app suddenly increase, the increase might not be reflected in an autoscaling event until the average for the metric increases.

## App has reached autoscaling limit

The number of instances for the app might have already reached the upper scaling limit you configured.

To determine whether the app has reached the maximum number of instances:

1. In a terminal window, run:

```
cf autoscaling-events APP-NAME
```

Where `APP-NAME` is the name of your app.

If Autoscaler has attempted to scale the app above the configured upper scaling limit, this command returns output that contains an event description similar to the following example:

```
cannot scale up. At max limit of 20 instances.
```

2. To review the upper and lower scaling limits you configured for the app, run:

```
cf autoscaling-apps
```

The previous command returns output similar to the example following:

Name	Guid	Enabled	Min Inst
example-app	85a6aff3-c739-4364-8df3-44f1aa50662b	true	1
Axes	Max Instances	Scale Up Factor	Scale Down Factor
20	5	1	

To resolve this issue, you can configure a higher upper scaling limit for the app. For more information, see [Autoscaling limits](#) in *Using App Autoscaler in Production*.

## Space or org quota is reached

The app might have already reached the number of app instances or used the amount of memory that the quota plan for the space or org allows. When an app reaches a resource quota for the space or org in which it is deployed, Autoscaler does not record an autoscaling event. For more information, see [Reviewing space and org quota plans](#) in *Using App Autoscaler in Production*.

Review the quotas for both the space and the org in which your app is deployed to ensure that there are enough resources available in their quota plans for Autoscaler to create new app instances.

To review the available resource quotas for the space and org in which an app is deployed:

1. In a terminal window, view the name of the quota plan for the space in which the app is deployed by running:

```
cf space SPACE-NAME
```

Where `SPACE-NAME` is the name of the space in which the app is deployed.

In the terminal output that appears, the value of `space quota` is the name of the quota plan for the space.

2. Record the name of the quota plan for the space that you retrieved in the previous step.
3. View the name of the quota plan for the org containing the space in which the app is deployed by running:

```
cf org ORG-NAME
```

Where `ORG-NAME` is the name of the org containing the space in which the app is deployed.

In the terminal output that appears, the value of `quota` is the name of the quota plan for the org.

4. Record the name of the quota plan for the org that you retrieved in the previous step.
5. Review the available resource quotas for the space in which the app is deployed by running:

```
cf space-quota QUOTA-PLAN-NAME
```

Where `QUOTA-PLAN-NAME` is the name of the space quota plan that you recorded in a previous step.

The previous command returns output similar to the following example:

```
Getting quota example-space info as admin@example.com...
OK

Total Memory      2G
Instance Memory   1G
Routes            10
Services          10
Paid service plans allowed
App instance limit 10
Reserved Route Ports 0
```

6. Review the available resource quotas for the org in which the app is deployed by running:

```
cf org-quota QUOTA-PLAN-NAME
```

Where `QUOTA-PLAN-NAME` is the name of the org quota plan that you recorded in a previous step.

This command returns output similar to the following example:

```
Getting quota example-org info as admin@example.com...
OK

Total Memory          10G
Instance Memory       1G
Routes                100
Services              100
Paid service plans   allowed
App instance limit    100
Reserved Route Ports 0
```

You can also try manually scaling the app. If the app has already reached one or more resource quota limits for your space or org, the Cloud Controller returns an error similar to the following example:

```
memory quota_exceeded
FAILED
```

To scale an app manually, see [Scale an app manually](#) in *Managing apps and service instances using Apps Manager* or [Scaling an app using cf scale](#).

Additionally, operators can configure verbose logging for Autoscaler that shows logs if Autoscaler fails to scale an app as a result of reaching a resource quota limit. For more information, see [Configure verbose logging for Autoscaler](#) in *Operating Autoscaler*.

## Autoscaling is disallowed

In order for Autoscaler to function in a TAS for VMs deployment, you must set the **App Autoscaler Errand** to **On** in the **Errands** pane of the TAS for VMs tile, and you must configure Autoscaler to scale the apps you want to autoscale.

### Approve autoscaling

Autoscaling for an app:

1. Ensure that the **App Autoscaler Errand** is set to **On** in the **Errands** pane of the TAS for VMs tile. To configure the **App Autoscaler Errand** to deploy Autoscaler, see [Configure errands](#) in *Configuring TAS for VMs*.
2. Configure Autoscaler to scale the app through either the App Autoscaler Command-Line Interface (CLI) or Apps Manager. To configure autoscaling for an app through the App Autoscaler CLI, see [Enable autoscaling](#) in *Using the App Autoscaler CLI*. To configure autoscaling for an app through Apps Manager, see [Create and bind the App Autoscaler service](#) in *Scaling an App Using App Autoscaler*.

### View apps configured to autoscale

To see whether autoscaling is configured for the apps you want to scale:

1. In a terminal window, run:

```
cf autoscaling-apps
```

This command returns a list of apps that are bound to Autoscaler, similar to the following example:

Presenting autoscaler apps in org example-org / space example-space as user						
Name	Min Instances	Max Instances	Guid	Scale Up Factor	Scale Down Factor	Enabled
example-app			e0077xa5-34mp-42l7-e377-e0fcb14d67f3			true
example-app-1	1	4		1	1	
example-app-2			3e8x6a84-0m6p-4le9-9335-0aad3979d672			false
OK	10	40		5	2	

If autoscaling is configured for an app that is bound to Autoscaler, the value shown in the ‘Enabled’ column of the terminal output is ‘true’. If autoscaling is not configured for an app that is bound to Autoscaler, the value shown in the ‘Enabled’ column of the terminal output is ‘false’.

## TAS for VMs components are failing or underscaled

Autoscaler might fail to scale an app if one of the TAS for VMs components on which it depends is failing or underscaled. For more information about these components, see [Failure modes](#) in *Using Debug Logs for App Autoscaler*.

These components might need to be restarted or scaled up before Autoscaler can scale your app. To restart TAS for VMs components, see [Stopping and starting individual TAS for VMs VMs](#) in *Stopping and Starting Virtual Machines*. To scale TAS for VMs components up, see [Scaling up TAS for VMs](#) in *Scaling TAS for VMs*.

## Autoscaler fails to scale apps based on RabbitMQ queue depth metric

This section describes possible causes for Autoscaler failing to scale an app using RabbitMQ queue depth as its scaling metric.

### Specified queue name in autoscaling rule is incorrect

Autoscaler cannot scale an app if the RabbitMQ queue name specified in your autoscaling rule is incorrect. Ensure that the queue name you configured in the autoscaling rule for the app is correct.

### Autoscaler does not support runtime CredHub

You might see an autoscaling event similar to the following example:

```
Autoscaler did not receive any metrics for rabbitmq.example-queue during the scaling window. Scaling down is deferred until these metrics are available.
```

To receive RabbitMQ queue depth metrics, Autoscaler must be able to retrieve service binding credentials for the RabbitMQ HTTP Management API from Cloud Controller. However, when a TAS for VMs deployment is configured to store credentials in the runtime CredHub, Autoscaler cannot retrieve service binding credentials from Cloud Controller.

If the operator of your deployment has selected **Yes** under **On Demand - Secure Service Instance Credentials with Runtime CredHub** in the **Global Settings for On-Demand Plans** pane of the VMware Tanzu RabbitMQ for VMs tile and selected the **Secure service instance credentials** check box in the **CredHub** pane of the TAS for VMs tile, Autoscaler is unable to use RabbitMQ queue depth as the scaling metric for apps bound to RabbitMQ service instances.

As a workaround, you can configure your app to emit a Custom App Metric containing the RabbitMQ queue depth and configure Autoscaler to use this metric as its scaling metric for the app. For more information about Custom App Metrics, see [Using custom scaling metrics](#).

## Autoscaler does not scale an app to expected number of instances

This section describes possible causes for Autoscaler scaling an app up to a certain number of instances, but not to the level that you expect. To determine the cause, see the following sections.

### Review scaling metric values

The values of the scaling metric you configured Autoscaler to use for your app might be lower than you expect. For example, if you are load-testing your app and your load-testing tool is not working correctly, you might be generating less load on the app than you expect. For more information about load-testing an app, see [Load-testing your app](#) in *Using App Autoscaler in production*.

To review the values of your scaling metric, review the observability service that you use for your TAS for VMs deployment.

### TAS for VMs components are underscaled

If any TAS for VMs components on which Autoscaler depends are underscaled, Autoscaler cannot scale the number of app instances up enough to accommodate the amount of traffic that the app is receiving.

For more information about how to determine which TAS for VMs components might be too underscaled to adequately support Autoscaler, see [Failure modes](#) in *Using Debug Logs for App Autoscaler*.

#### Log cache is underscaled

When the averaged metric values that you see in autoscaling events are lower than you expect, it often means that Log Cache is underscaled. If Log Cache is underscaled, Autoscaler might not be able to retrieve all of the metrics associated with your app. When Autoscaler cannot retrieve enough metrics, it cannot calculate an accurate average metric value to record in autoscaling events.

To determine whether Log Cache might be underscaled:

1. In a terminal window, run:

```
cf autoscaling-events
```

This command returns a list of autoscaling events that Autoscaler has recorded, which include averaged values of the scaling metric for your app.

If the averaged metric values in the autoscaling events for an app are lower than the actual load that the app is processing, Log Cache might be evicting some metrics from its cache.

To fix this issue, try:

- Scale Log Cache horizontally by increasing the number of Log Cache instances in the **Resource Config** pane of the TAS for VMs tile. To scale Log Cache horizontally, see [Scaling up TAS for VMs](#) in *Scaling TAS for VMs*.
- Scale Log Cache vertically by increasing the amount of memory in each instance of Log Cache. To scale Log Cache vertically, see [Scaling an app using cf scale](#).
- Increase the maximum number of envelopes that Log Cache can store per app by configuring the **Maximum number of envelopes stored in Log Cache per source** text boxes in the **Advanced Features** pane of the TAS for VMs tile. To configure the maximum number of envelopes that Log Cache can store, see [Maximum number of envelopes stored in log cache per source](#) in *Configuring TAS for VMs*.

For more information about how Log Cache supports Autoscaler, see [Log Cache in Operating App Autoscaler](#).

## Autoscaler scales apps more slowly than expected

Autoscaler is itself an app that TAS for VMs deploys. By default, there are three instances of the Autoscaler app, `autoscale`, that can scale other apps in your TAS for VMs deployment. Each instance of Autoscaler queries the MySQL database in your TAS for VMs deployment to claim and process a set of apps that might must be scaled. Each Autoscaler instance claims a different set of apps to process and scale independently of the other two Autoscaler instances. After an Autoscaler instance has processed and scaled one set of apps, it queries the MySQL database again and repeats the process.

Each Autoscaler instance evaluates 10 apps at a time to verify whether they must be scaled. The speed at which an Autoscaler instance can process a batch of apps is verified primarily by the number of metrics it retrieves from Log Cache for the apps within that batch. If Log Cache holds a large number of metrics for an app, Autoscaler does not begin processing the next batch of apps until either it retrieves all of those metrics or the request that Autoscaler makes to Log Cache for those metrics times out.

To ensure that Autoscaler can scale all the apps for which you configured autoscaling,, you must increase the number of Autoscaler instances for your TAS for VMs deployment.

To increase the number of Autoscaler instances:

1. Go to the VMware Tanzu Operations Manager Installation Dashboard.
2. Click the **VMware Tanzu Application Service** tile.
3. Click **App Autoscaler**.
4. In the **App Autoscaler instance count** text box, enter the number of Autoscaler instances you want to deploy.
5. Click **Save**.
6. Return to the Tanzu Operations Manager Installation Dashboard.

7. Click **Review Pending Changes**.
8. In the **VMware Tanzu Application Service** tile, click **Errands**. The **Errands** menu expands.
9. Ensure that the **App Autoscaler Errand** check box is activated.
10. Click **Apply Changes**.

## Scaling to and from zero instances

Autoscaler can scale an app to and from zero instances only when it is configured to use RabbitMQ queue depth as its scaling metric.

Because other scaling metrics are not emitted when an app has zero instances, Autoscaler cannot scale an app to and from zero instances when it is configured to use any scaling metric other than RabbitMQ queue depth.

## New app instances are slow to respond to requests

When Autoscaler scales an app up, the new app instances can be slow to respond to requests. As a result, if you configure Autoscaler to use HTTP Request Latency as the scaling metric for the app, Autoscaler might scale the number of app instances up even more to compensate for the slow response time of the app instances it had previously created.

When a new app instance is created, Diego runs health checks for the app instance. After all health checks are complete, Diego considers the app instance to be healthy. Diego then registers a route to the app instance with the Gorouter, and the Gorouter begins routing requests to the app instance.

However, the app instance having passed all health checks might not indicate that the app instance is ready to respond to requests. Depending on the type of health check that you configured the app, the Gorouter might begin to route requests to app instances that are not ready to receive requests.

The following list describes when the Gorouter begins routing requests to an app instance after each type of health check:

- If you configured a `process` health check, the Gorouter can begin routing requests to the app instance when all processes within the app are running.
- If you configured a `port` health check, the Gorouter can begin routing requests to the app instance when the app instance receives a TCP connection, even if it is not fully initialized.
- If you configured an `http` health check, the Gorouter can begin routing requests to the app instance when the app instance can provide an `HTTP 200` response to the health check, which indicates that the app instance is ready to respond to HTTP requests from the Gorouter.

If the new app instances that Autoscaler has created are slow to respond to requests, you can configure Diego to run `http` health checks for your app to ensure that the Gorouter cannot route requests to app instances before they are ready to respond.

For more information about how Diego runs an app, see [How Diego runs an app in \*Diego Components and Architecture\*](#). For more information about app health checks, including how to configure health checks and the types of health checks you can configure, see [Using app Health Checks](#).

Alternatively you can [configure the cooldown period](#) for the app to better align with the app's startup time to avoid further scaling actions during that period. Note that the cooldown period does not change the metric

interval used to make the scaling decision after the cooldown period has elapsed. So a cooldown period of slightly longer than the actual startup time of the app may provide a better representation of the app's performance for the value used to make the subsequent scaling decision.

## One Autoscaler service instance per space

Only one service instance of Autoscaler can exist in each space in an org. If you try to create more than one Autoscaler service instance in a space, you see the following error:

```
Unexpected Response
Response code: 409
CC code: 10001
CC error code: CF-ServiceBrokerConflict
Request ID: b3b6236b-82f5-42a7-5015-338369d5fea2::9d7c8b3a-0c4f-4935-b493-
d6fe3f417f3b
Description: Service broker error: Only One App Autoscaler Service Instance
Approved Per Space
FAILED
```

You must use the existing Autoscaler service instance in your space and bind it to the app you want to autoscale. For more information, see [Create and bind the App Autoscaler service](#) in *Scaling an App using App Autoscaler*.

## App Autoscaler for Cloud Foundry does not work with TAS for VMs

There are two versions of the App Autoscaler CLI extension for the Cloud Foundry Command-Line Interface (cf CLI):

- The VMware Tanzu App Autoscaler CLI Plug-in, used with TAS for VMs.
- The Cloud Foundry App Auto-Scale plug-in, used with open-source Cloud Foundry deployments.

If you attempt to use the Cloud Foundry App Auto-Scale plug-in to control the App Autoscaler instance in your TAS for VMs deployment, you see the following error:

```
Error: Invalid AutoScaler API endpoint
```

You must instead use the VMware Tanzu App Autoscaler CLI Plug-in. To download the VMware Tanzu App Autoscaler CLI plug-in, go to [Broadcom Support](#).

## Using the cf CLI

These topics explain the Cloud Foundry Command Line Interface (cf CLI), a tool used to deploy and manage apps.

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## Installing the cf CLI

The Cloud Foundry Command Line Interface (cf CLI) is the official command line client for Cloud Foundry. Use the cf CLI to interact with Cloud Foundry applications and services.

The following procedures describe how to install the cf CLI on your operating system. You can install the cf CLI with a package manager, an installer, or a compressed binary.

For more information about how to use the cf CLI, see [Getting Started with cf CLI](#).

To learn when cf CLI updates are released and to download a new binary or installer, see [Releases](#) in the Cloud Foundry CLI repository on GitHub.

There are currently two major versions of the cf CLI: v7 and v8. See [the README](#) to decide which version to use.

## Prerequisites

If you have previously used the cf CLI Ruby gem, you must uninstall it before installing the cf CLI.

To uninstall the gem:

1. Run:

```
gem uninstall cf
```

2. Verify that your Ruby environment manager uninstalled the gem by closing and reopening your terminal.

## Install the cf CLI using a package manager

These sections describe how to install the cf CLI using a package manager. You can install the cf CLI using a package manager on macOS X and Linux operating systems.

### Linux installation

There are two ways to install the cf CLI using a package manager, depending on your Linux distribution.

To install the cf CLI on Debian and Ubuntu-based Linux distributions:

1. Add the Cloud Foundry Foundation public key and package repository to your system by running:

```
wget -q -O - https://packages.cloudfoundry.org/debian/cli.cloudfoundry.org.key
| sudo gpg --dearmor -o /usr/share/keyrings/cli.cloudfoundry.org.gpg
echo "deb [signed-by=/usr/share/keyrings/cli.cloudfoundry.org.gpg] https://pack
```

```
ages.cloudfoundry.org/debian stable main" | sudo tee /etc/apt/sources.list.d/cloudfoundry-cli.list
```

2. Update your local package index by running:

```
sudo apt-get update
```

3. To install **cf CLI v7**, run:

```
sudo apt-get install cf7-cli
```

4. To install **cf CLI v8**, run:

```
sudo apt-get install cf8-cli
```

To install the cf CLI on Enterprise Linux and Fedora RHEL6/CentOS6 and later distributions:

1. Configure the Cloud Foundry Foundation package repository by running:

```
sudo wget -O /etc/yum.repos.d/cloudfoundry-cli.repo https://packages.cloudfoundry.org/fedora/cloudfoundry-cli.repo
```

2. To install **cf CLI v7**, run:

```
sudo yum install cf7-cli
```

3. To install **cf CLI v8**, run:

```
sudo yum install cf8-cli
```

This also downloads and adds the public key to your system.

## macOS X installation

You can install the cf CLI on macOS X operating systems using the Homebrew package manager.

To install the cf CLI for macOS X using Homebrew:

1. Install Homebrew. For instructions, see [Install Homebrew](#) on the Homebrew website.
2. To install **cf CLI v7**, run:

```
brew install cloudfoundry/tap(cf-cli@7)
```

3. To install **cf CLI v8**, run:

```
brew install cloudfoundry/tap(cf-cli@8)
```

## Install the cf CLI using an Installer

This section describes how to install the cf CLI using an installer. You can install the cf CLI using an installer on Microsoft Windows, Mac OS X, and Linux operating systems.

## Linux installation

This section describes how to install the cf CLI using an installer on the Debian, Ubuntu, and Red Hat Linux distributions.

To install the cf CLI for Linux using an installer, do the following:

1. Download the Linux installer.
  - o **Debian or Ubuntu:** Paste the following URL in a browser to download the installer:

```
https://cli.run.pivotal.io/stable?release=debian64&source=github
```

- o **Red Hat:** Paste the following URL in a browser to download the installer:

```
https://cli.run.pivotal.io/stable?release=redhat64&source=github
```

2. Install the cf CLI using your system's package manager.



The following commands might require `sudo`.

- o **Debian or Ubuntu:** Run the following command:

```
dpkg -i path/to/cf-cli-*.deb && apt-get install -f
```

- o **Red Hat:** Run the following command:

```
rpm -i path/to/cf-cli-*.rpm
```

## Mac OS X installation

This section describes how to install the cf CLI on Mac OS X operating systems using an installer.

To install the cf CLI for Mac OS X using an installer, do the following:

1. Paste the following URL in a browser to download the installer:

```
https://cli.run.pivotal.io/stable?release=macosx64&source=github
```

2. Open the `.pkg` file.
3. In the installer wizard, click **Continue**.
4. Select an install destination and click **Continue**.
5. Click **Install**.

## Windows installation

This section describes how to install the cf CLI for use on the Windows command line. For instructions on how to install the cf CLI for use on the Windows Subsystem for Linux (WSL), also known as Bash, see [Linux installation](#).

To install the cf CLI for Windows using an installer, do the following:

1. Paste the following URL in a browser to download the installer:

```
https://cli.run.pivotal.io/stable?release=windows64&source=github
```

2. Unzip the file.
3. Right-click the `cf_installer` executable and select **Run as Administrator**.
4. When prompted, click **Install**. Then, click **Finish**.

## Install the cf CLI using a compressed binary

You can install the cf CLI using a compressed binary on Windows, macOS X, and Linux operating systems. This method can be a more secure option compared to installing from a repository, especially in environments where security is a primary concern.



As of cf CLI 8.4.0 and cf CLI 7.5.0, the Apple ARM architecture is now supported for installation of cf CLI. This is possible on newer MACs that use M1 and M2 processors. For systems running the M1 processor, cf CLI can now be installed without use of an emulator.

For more information about downloading and installing a compressed binary for cf CLI v7 or cf CLI v8, see [Installers and compressed binaries](#).

## Verify installation

To verify the installation of the cf CLI:

1. Close and reopen the command prompt, or open a new tab in the command prompt terminal.
2. Run:

```
cf --help
```

If your installation was successful, the cf CLI help listing appears.

## Uninstall the cf CLI

These sections describe how to uninstall the cf CLI. The method for uninstalling the cf CLI differs depending on the installation method.

### Package manager

If you installed the cf CLI with a package manager, follow the instructions specific to your package manager.

### Installer

If you installed the cf CLI with an installer, follow the procedure in this section that is specific to your operating system.

To uninstall the cf CLI on macOS X:

1. Delete the binary `/usr/local/bin/cf`.
2. Delete the directory `/usr/local/share/doc/cf-cli`.

To uninstall the cf CLI on Windows:

1. Go to the **Control Panel** and click **Programs and Features**.
2. Select **Cloud Foundry CLI VERSION**.
3. Click **Uninstall**.

## Binary

To uninstall the cf CLI after installing it with a binary:

1. Go to the location where you copied the binary.
2. Delete the binary.

## Upgrading to cf CLI v7

The main goal of Cloud Foundry Command Line Interface (cf CLI) v7 and CAPI V3 is to unlock new app developer workflows for users who require granular control of their apps and other advanced deployment strategies. For more information, see [New Workflows Supported](#) below. These workflows were previously limited by CAPI V2.

The cf CLI development team aims to provide:

- A seamless upgrade experience from cf CLI v6. Changes have been kept to a minimum. Where there are changes, the team has incorporated feedback from the community to simplify the cf CLI user experience.
- Details about potential breaking changes and alternative workflows for scripting environments.

To understand the differences between specific commands, see [Command Differences](#) below.

For more information about CAPI V3, see the [CAPI V3 documentation](#). For more information about CAPI V2, see the [CAPI V2 documentation](#).

## New workflows supported by cf CLI v7

cf CLI v7 uses CAPI V3, which offers developers more granular control over their apps. It activates new workflows by exposing packages, droplets, builds, and processes. CAPI V3 also includes new resources, for example, sidecars, manifests, and deployments.

Some key new features available with the cf CLI v7 are:

- [Rolling App Deployments](#): Push updates to apps without incurring downtime.
- [Running cf push Sub-Step Commands](#): Exercise granular control over the cf push process. These commands break down the cf push process into sub steps that can run independently.
- [Pushing an App with Multiple Processes](#): Use a single command to push apps that run multiple processes. An example is a web app that has a UI process and a worker process.
- [Pushing Apps with Sidecar Processes](#): Run additional processes in the same container as your app.

- **Using Metadata:** Add metadata to objects, for example, spaces, and apps. This aids in operations, monitoring, and auditing.

## Installing cf CLI v7

To install cf CLI v7, see the [README](#) in the Cloud Foundry CLI repository on GitHub. It includes instructions for downloading the latest CAPI release candidate, which is what the cf CLI v7 beta is tested against.

### Prerequisites

The cf CLI v7 requires [cf-deployment](#) v13.5.0 or later.

This version of cf-deployment contains CAPI release v1.95.0, which provides the CAPI V3 API v3.85.0.

For more information, see the [CAPI release notes](#) and the [Cloud Controller release notes](#) on GitHub.

If you target an later version of cf-deployment, cf CLI v7 presents a warning saying that the API version is less than the minimum supported. Not all commands run correctly. For example, `cf apps` does not work.

## Command differences

These sections describe changes in commands from cf CLI v6 to cf CLI v7. They also provide important information for those who use the cf CLI in scripts.

For information about potential breaking changes, see the [Table of Differences](#) below. This table includes removed flag options, removed commands, and removed or changed argument requirements.

### About scripting

If you have scripts that rely on the cf CLI, this section describes possible changes in cf CLI v7 which might affect scripts.

Some of these changes are:

- In cf CLI v7, if your scripts parse error text, output text errors are returned directly from CAPI. Where possible, cf CLI v7 no longer wraps errors it receives from the API.
- cf CLI v7 commands output errors and warnings to `stderr` rather than `stdout` to simplify debugging.
- Style changes including flavor text updates. For more information, see [Colors](#) in [cf CLI Style Guide](#) in the Cloud Foundry CLI repository on GitHub.
- Key-value and table column headers are displayed in lowercase.
- Single-quote resource names appear in error cases.



If the services attribute is declared at the top-level of the manifest.yml file, cf CLI v6 generates a warning, but in cf CLI v7, there is no warning and the app is still pushed.

## Exit codes

cf CLI v7 attempts to consistently apply the principles of idempotency across all commands which require it. For more information, see [General Principles](#) in *cf CLI Style Guide* in the Cloud Foundry CLI repository on GitHub. Commands now exit `0` if the outcome a user expresses when running a specific command is unchanged after the command is executed. Examples include:

- Attempting to delete a resource which does not exist, for example, a space. Commands like `delete-route` and `delete-space` return `0` in those cases.
- If the `create-buildpack` command fails to create a buildpack, the command exits with `1` instead of `0`, which is the current cf CLI v6 behavior.

## Table of differences

The following table summarizes how commands differ between cf CLI v7 and cf CLI v6.

Command	Changes
<code>cf add-network-policy</code>	<ul style="list-style-type: none"> <li>• <b>[Removed flag]:</b> The flag <code>--destination-app</code> is deprecated. Instead, the destination app is the required second argument, using no flag.</li> </ul>
<code>cf apps</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Displays information about <code>processes</code>.</li> <li>• <b>[Update]:</b> The <code>url</code> field is renamed to <code>routes</code>.</li> <li>• <b>[Update]:</b> Information about <code>instances</code>, <code>memory</code>, and <code>disk</code> is removed.</li> <li>• <b>[Update]:</b> Apps are listed alphabetically.</li> </ul>
<code>cf bind-security-group</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> <code>SPACE</code> is no longer an argument. To provide a space, use the <code>--space</code> flag.</li> </ul>
<code>cf check-route</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> <code>HOST</code> is no longer a required argument.</li> <li>• <b>[Update]:</b> No longer requires a backslash.</li> <li>• <b>[Added flag]:</b> Use <code>--hostname</code> to specify a hostname.</li> </ul>
<code>cf create-buildpack</code>	<ul style="list-style-type: none"> <li>• <b>[Removed flag]:</b> <code>--enable</code>. Creating a buildpack activates it by default.</li> <li>• <b>[Removed flag]:</b> <code>--disable</code>. You can not deactivate a buildpack upon creation.</li> <li>• <b>[Update]:</b> Creating a buildpack with position set to <code>0</code> is no longer valid.</li> </ul>
<code>cf create-domain</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>create-private-domain</code>.</li> </ul>
<code>cf create-org</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> <code>clients.read</code> scope (or <code>clients.admin</code>, or <code>zones.uaa.admin</code>) is now required when logged in using client credentials.</li> </ul>
<code>cf create-quota</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>create-org-quota</code>.</li> </ul>

Command	Changes
<code>cf create-space</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> <code>clients.read</code> scope (or <code>clients.admin</code>, or <code>zones.uaa.admin</code>) is now required when logged in using client credentials.</li> </ul>
<code>cf create-route</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> <code>SPACE</code> is no longer a required argument. The command creates a route in the space you are targeting.</li> <li>• <b>[Removed flag]:</b> <code>--random-port</code>. This is now default behavior for routes with TCP domains if the <code>--port</code> flag is not provided.</li> </ul>
<code>cf create-service-auth-token</code>	<i>This command is removed.</i>
<code>cf create-service-broker</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> If the command does not successfully complete all phases, a service broker object exists, which can then be updated or deleted.</li> </ul>
<code>cf create-user</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> <code>--password-prompt</code>. This option enhances security by eliminating the need to enter your password directly on the command line.</li> </ul>
<code>cf delete</code>	<ul style="list-style-type: none"> <li>• <b>[Change in flag behavior]:</b> <code>-r</code> no longer deletes routes when the route is mapped to more than one app.</li> </ul>
<code>cf delete-domain</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>delete-private-domain</code>.</li> </ul>
<code>cf delete-org</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> The command fails if the org contains shared private domains.</li> </ul>
<code>cf delete-quota</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>delete-org-quota</code>.</li> </ul>
<code>cf delete-service-auth-token</code>	<i>This command is removed.</i>
<code>cf domains</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> The <code>status</code> column is renamed to <code>availability</code>.</li> <li>• <b>[Update]:</b> The table refers to private domains with <code>private</code> instead of <code>own</code>.</li> </ul>
<code>cf files</code>	<i>This command is removed.</i>
<code>cf map-route</code>	<ul style="list-style-type: none"> <li>• <b>[Removed flag]:</b> <code>--random-port</code>. In the cf CLI v7, when you map a TCP route to an app, a random port is assigned to the route by default. To specify a port for a TCP route, use the <code>--port</code> flag.</li> </ul>

Command	Changes
<code>cf marketplace</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed flag]:</b> The <code>-s</code> flag is renamed to <code>-e</code> for consistency with other commands.</li> <li>• <b>[Update]:</b> When the <code>-e</code> flag is specified, plan costs advertised by the service broker are displayed.</li> <li>• <b>[Update]:</b> When the <code>-e</code> flag is specified, and no service offering with that name is found, the exit code returned is 0. This is in contrast to the cf CLI v6, which returned exit code 1 in this case.</li> </ul>
<code>cf migrate-service-instances</code>	<i>This command is removed.</i>
<code>cf packages</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Displays packages from most recent to least recent.</li> </ul>
<code>cf push</code>	<ul style="list-style-type: none"> <li>• <b>[Removed flag]:</b> <code>--route-path</code>. You can use the <code>routes</code> property in the manifest instead.</li> <li>• <b>[Removed flag]:</b> <code>-d</code> for domain. You can use the <code>routes</code> property in the manifest instead.</li> <li>• <b>[Removed flag]:</b> <code>--no-hostname</code>. You can use the <code>routes</code> property in the manifest instead.</li> <li>• <b>[Removed flag]:</b> <code>--hostname</code>. You can use the <code>routes</code> property in the manifest instead.</li> <li>• <b>[Added flag]:</b> <code>--strategy</code>. You can deploy an app without causing downtime using <code>cf push app_name --strategy rolling</code>. Exits when at least one instance of each process is healthy.</li> <li>• <b>[Added flag]:</b> <code>--no-wait</code>. When used, the command exits when the one instance one process becomes healthy.</li> <li>• <b>[Added flag]:</b> <code>--endpoint</code>. Required if you set health check type to <code>http</code> when pushing an app.</li> <li>• <b>[Updated flag]:</b> <code>--health-check-type none</code> is removed in favor of <code>--health-check-type process</code>.</li> <li>• <b>[Updated flag]:</b> <code>--no-route</code> no longer unbinds all existing routes associated with the app.</li> <li>• <b>[Updated flag]:</b> <code>-t</code> now has a long form <code>--app-start-timeout</code>. All short-form flags now have long-form equivalents.</li> </ul>
<code>cf purge-service-offering</code>	<ul style="list-style-type: none"> <li>• <b>[Removed flag]:</b> The <code>-p</code> flag is removed.</li> </ul>
<code>cf quota</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>org-quota</code>.</li> </ul>
<code>cf quotas</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>org-quotas</code>.</li> </ul>
<code>cf remove-network-policy</code>	<ul style="list-style-type: none"> <li>• <b>[Removed flag]:</b> The flag <code>--destination-app</code> is deprecated. Instead, the destination app is the required second argument, using no flag.</li> </ul>

Command	Changes
<code>cf rename-buildpack</code>	<i>This command is removed. Instead, use <code>--rename</code> flag with <code>cf update-buildpack</code>.</i>
<code>cf restart-app-instance</code>	<ul style="list-style-type: none"> <li>• <b>[Added Flag]:</b> <code>--process</code></li> </ul>
<code>cf routes</code>	<ul style="list-style-type: none"> <li>• <b>[Updated output]:</b> <code>port</code>, <code>type</code>, and <code>service</code> no longer appear in the table.</li> <li>• <b>[Renamed flag]:</b> <code>--orglevel</code> is now <code>--org-level</code>.</li> </ul>
<code>cf run-task</code>	<ul style="list-style-type: none"> <li>• <b>[Updated]:</b> <code>COMMAND</code> is no longer an argument. To specify a command, use the <code>--command</code> flag.</li> <li>• <b>[Added Flag]:</b> <code>--process</code></li> </ul>
<code>cf scale</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> <code>--process</code></li> </ul>
<code>cf service-access</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> When a service offering comes from a space-scoped service broker, the space and org are displayed.</li> </ul>
<code>cf service-auth-tokens</code>	<i>This command is removed.</i>
<code>cf set-health-check</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> <code>--process</code></li> <li>• <b>[Added flag]:</b> <code>--invocation-timeout</code></li> </ul>
<code>cf set-quota</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>set-org-quota</code>.</li> </ul>
<code>cf set-running-environment-variable-group</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> System environment variables can only be strings. This is enforced on the API.</li> </ul>
<code>cf set-staging-environment-variable-group</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> System environment variables can only be strings. This is enforced on the API.</li> </ul>
<code>cf ssh</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> <code>--process</code></li> <li>• <b>[Added environment variable]:</b> <code>all_proxy</code>. Specifies a proxy server for all requests.</li> </ul>
<code>cf start</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Stages an app to support <code>cf push app --no-start</code> use cases. If there is a new package, <code>start</code> stages and starts using the new package. If the app has been rolled back, <code>start</code> starts using the droplet you used to roll back your app. In the case of a droplet that is in a <code>FAILED</code> state, <code>start</code> ignores the failed droplet and restages the latest <code>READY</code> package to try to produce a healthy droplet. In cf CLI v6, <code>start</code> fails if the droplet is in a <code>FAILED</code> state.</li> </ul>
<code>cf unshare-private-domain</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> This command now provides a warning and requires confirmation before it proceeds.</li> </ul>

Command	Changes
<code>cf update-buildpack</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> <code>--rename</code></li> <li>• <b>[Change in flag behavior]:</b> <code>--unlock</code> and <code>--path</code> are now compatible.</li> </ul>
<code>cf update-quota</code>	<ul style="list-style-type: none"> <li>• <b>[Renamed]:</b> This command is renamed to <code>update-org-quota</code>.</li> </ul>
<code>cf update-service-auth-token</code>	<i>This command is removed.</i>
<code>cf v3-COMMAND</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> <code>v3</code> prefixes have been removed, since the commands now use CAPI V3 by default.</li> </ul>
<code>cf apply-manifest</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> If no flags are passed, the command defaults to using the manifest located in your <code>pwd</code>.</li> </ul>
<code>cf v3-cancel-zdt-push</code>	<ul style="list-style-type: none"> <li>• <i>This command is removed. Instead, use <code>cf cancel-deployment</code>.</i></li> </ul>
<code>cf v3-zdt-push</code>	<ul style="list-style-type: none"> <li>• <i>This command is removed. Instead, use <code>--strategy rolling</code> flag with <code>cf push</code>.</i></li> </ul>
<code>cf buildpacks</code>	<ul style="list-style-type: none"> <li>• The order of the columns are changed. The buildpack column header is renamed.</li> </ul>

## Upgrading to cf CLI v8

You can use Cloud Foundry Command Line Interface (cf CLI) v8 to interact with Cloud Foundry API (CAPI) V3. This topic describes the major changes between cf CLI v7 and cf CLI v8.

The cf CLI development team aims to provide:

- A seamless upgrade experience from cf CLI v7. Changes are minimal. Where there are changes, the team has incorporated feedback from the community to simplify the cf CLI user experience.
- Details about potential breaking changes and alternative workflows for scripting environments.

To understand the differences between specific commands, see [Command differences](#) below.

For more information about CAPI V3, see the [CAPI V3 documentation](#).

For more information about cf CLI v8, see [v8.0.0](#) in GitHub.

## New workflows supported by cf CLI v8

Some key new features available through the cf CLI v8 are:

- **Asynchronous service operations:** All service-related operations are now asynchronous by default. This includes manipulating service keys and route bindings.

## Install cf CLI v8

To install cf CLI v8, see the [README](#) in the Cloud Foundry CLI repository on GitHub. It includes instructions for downloading the latest CAPI release candidate, which is what the cf CLI v8 beta is tested against.

In cf CLI v8, Golang has been updated from v1.13 to v1.16. When targeting a foundation that does not have a SAN, you might encounter errors because the common name field is deprecated in Golang v1.15 and later. For more information, see [X.509 CommonName deprecation](#) in the Golang v1.15 release notes.

## Prerequisites

The cf CLI v8 requires [cf-deployment](#) v16.11.0 or later.

This version of cf-deployment contains CAPI release v1.109.0, which provides the CAPI V3 API v3.99.0.

For more information, see the cf CLI [Versioning and Support Policy](#) on GitHub.

## Command differences

These sections describe changes in commands from cf CLI v7 to cf CLI v8. They also provide important information for those who use the cf CLI in scripts.

For information about possible breaking changes, see the [Table of differences](#) below. This table includes removed flag options, updated output, and removed or changed argument requirements.

## Manifest differences

When you apply a manifest by running `cf push`, cf CLI v8 does not provide a manifest diff through the V3 manifest diff endpoint. This new endpoint supports version 1 manifests only. For more information, see [Create a manifest diff for a space \(experimental\)](#) in the CAPI documentation.

## About scripting

If you have scripts that rely on the cf CLI, this section describes possible changes in cf CLI v8 that might affect scripts.

Some of these changes are:

- Style changes, including changes in the order or wording of the output.
- cf CLI v8 uses CAPI V3 to make requests related to services. CAPI V3 creates asynchronous jobs. If you want to continue to create jobs synchronously, use the new `--wait` flag.
- JSON response changes such as additional elements or nesting, which may impact parsing in existing scripts.

## Table of differences

The following table summarizes how commands differ between cf CLI v7 and cf CLI v8.

Command	Changes
<code>cf bind-service</code>	<ul style="list-style-type: none"> <li>[Added flag]: Use <code>--wait</code> to wait for the bind operation to complete.</li> </ul>

Command	Changes
<code>cf bind-route-service</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Bind route operation is async by default.</li> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the bind operation to complete.</li> </ul>
<code>cf create-service</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the create operation to complete.</li> </ul>
<code>cf create-service-key</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Create operation is async by default.</li> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the create operation to complete.</li> </ul>
<code>cf delete-service</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the delete operation to complete.</li> </ul>
<code>cf delete-service-key</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Delete operation is async by default.</li> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the delete operation to complete.</li> </ul>
<code>cf map-route</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--app-protocol</code> to use HTTP/2 protocol to communicate with apps. By default, if app-protocol is not set, HTTP/1 protocol is used for HTTP route.</li> </ul>
<code>cf marketplace</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--show-unavailable</code> to show plans that are not available for use.</li> </ul>
<code>cf route</code>	<ul style="list-style-type: none"> <li>• <b>[New]:</b> New command for viewing details about a route and its destinations.</li> </ul>
<code>cf routes</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Added <code>service instance</code> column to output.</li> </ul>
<code>cf service</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--params</code> to retrieve and display the given service instances's parameters as JSON. All other output is suppressed.</li> <li>• <b>[Update]:</b> Displays information about <code>guid</code>, <code>type</code>, and <code>broker tags</code>.</li> <li>• <b>[Update]:</b> The <code>service</code> field is renamed to <code>offering</code>.</li> <li>• <b>[Update]:</b> The <code>service broker</code> field is renamed to <code>broker</code>.</li> <li>• <b>[Update]:</b> The <code>dashboard</code> field is renamed to <code>dashboard url</code>.</li> <li>• <b>[Update]:</b> Minor changes to the ordering and wording of each block of information.</li> </ul>
<code>cf service-key</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Displays information about <code>last operation</code> and <code>message</code> as new columns.</li> <li>• <b>[Response]:</b> All JSON response elements from v7 are now wrapped into an additional element named <code>credentials</code>.</li> </ul>

Command	Changes
<code>cf services</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--no-apps</code> to not retrieve bound apps information.</li> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the operation to complete.</li> </ul>
<code>cf unbind-service</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the unbind operation to complete.</li> </ul>
<code>cf unbind-route-service</code>	<ul style="list-style-type: none"> <li>• <b>[Update]:</b> Unbind route operation is async by default.</li> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the unbind operation to complete.</li> </ul>
<code>cf update-service</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> Use <code>--wait</code> to wait for the update operation to complete.</li> <li>• <b>[Removed flag]:</b> <code>--upgrade</code>. Use new command <code>cf upgrade-service</code> to upgrade a plan.</li> </ul>
<code>cf upgrade-service</code>	<ul style="list-style-type: none"> <li>• <b>[Added flag]:</b> <code>--force</code>. There is no longer user interaction required on this command.</li> </ul>

## Getting started with the cf CLI

The Cloud Foundry Command Line Interface (cf CLI) is the official command line client for Cloud Foundry. You can use the cf CLI to manage apps, service instances, orgs, spaces, and users in your environment.

### Prerequisite

To follow the procedures in this topic, you must download and install the latest version of the cf CLI v7 or v8. For more information, see [Installing the Cloud Foundry command line interface](#).

### Log in with the CLI

The `cf login` command uses the syntax described below to specify a target API endpoint, login credentials, an org, and a space.

The cf CLI prompts for credentials as needed. If you are a member of multiple orgs or spaces, `cf login` prompts you to specify the org or space to which you want to log in. Otherwise, it targets your org and space automatically.

To log in to the cf CLI:

1. In a terminal window, run:

```
cf login -a API-URL -u USERNAME -p PASSWORD -o ORG -s SPACE
```

Where:

- `API-URL` is your API endpoint, the URL of the Cloud Controller in your TAS for VMs instance.

- **USERNAME** is your username.
- **PASSWORD** is your password. VMware discourages using the **-p** option, because it records your password in your shell history.
- **ORG** is the org where you want to deploy your apps.
- **SPACE** is the space in the org where you want to deploy your apps.

When you successfully log in, you see output similar to the following example:

```
API endpoint: https://api.example.com
```

```
Password>
Authenticating...
OK
```

```
Targeted org example-org
```

```
Targeted space development
```

```
API endpoint: https://api.example.com
User:           username@example.com
Org:            example-org
Space:          development
```

Alternatively, you can write a script to log in and set your target using the non-interactive `cf api`, `cf auth`, and `cf target` commands. See [UAAC](#) for setting up `client_id` and `client_secret`.

## Log in with the API

You can write a script to log in to the cf CLI. This allows you to avoid manually logging in to the cf CLI each time you use it.

To write a script to log in:

1. In a terminal window, target your API by running:

```
cf api API-URL
```

Where `API-URL` is your API endpoint, the URL of the Cloud Controller in your TAS for VMs instance.

For more information about the `cf api` command, use `cf api --help`.

2. Authenticate by running:

```
cf auth USERNAME PASSWORD
```

Where:

- **USERNAME** is your username.

- `PASSWORD` is your password. VMware discourages using the `-p` option, because it records your password in your shell history.

For more information about the `cf auth` command, use `cf auth --help`.

### 3. Target your org or space by running:

```
cf target -o ORG -s SPACE
```

Where:

- `ORG` is the org you want to target.
- `SPACE` is the space you want to target.

For more information about the `cf target` command, use `cf target --help`.

After you log in, the cf CLI saves a `config.json` file that contains your API endpoint, org, space values, and access token. If you change these settings, the `config.json` file is updated accordingly.

By default, `config.json` is located in the `~/.cf` directory. You can relocate the `config.json` file using the `CF_HOME` environment variable.

## Localize the cf CLI

The cf CLI translates terminal output into the language that you select. The default language is `en-US`.

The cf CLI supports these languages:

- Chinese (simplified): `zh-Hans`
- Chinese (traditional): `zh-Hant`
- English: `en-US`
- French: `fr-FR`
- German: `de-DE`
- Italian: `it-IT`
- Japanese: `ja-JP`
- Korean: `ko-KR`
- Portuguese (Brazil): `pt-BR`
- Spanish: `es-ES`

For more information about the `cf config --locale` command, use `cf config --help`.

Localizing the cf CLI affects only messages that the cf CLI generates.

To set the language of the cf CLI:

1. In a terminal window, log in to the cf CLI:

```
cf login
```

2. Run:

```
cf config --locale LANGUAGE
```

Where `LANGUAGE` is code of the language you want to set. Valid values are `zh-Hans`, `zh-Hant`, `en-US`, `fr-FR`, `de-DE`, `it-IT`, `ja-JP`, `ko-KR`, `pt-BR`, and `es-ES`.

3. Confirm the language change by running:

```
cf help
```

The above command returns output similar to the example below:

**NOME:**

`cf` - Uma ferramenta de linha de comando para interagir com Cloud Foundry

**USO:**

`cf [opções globais] comando [argumentos...] [opções de comando]`

**VERSÃO:**

`6.14.1`

`...`

## Manage users and roles

The cf CLI includes commands that list users and assign roles in orgs and spaces.

### List users

To list all users in an org or a space:

1. In a terminal window, log in to the cf CLI:

```
cf login
```

2. Run one of these commands:

- To list org users, run:

```
cf org-users ORG
```

Where `ORG` is the name of the org for which you want to see the list of users.

The above command returns output similar to the example below:

```
Getting users in org example-org as username@example.com...
ORG MANAGER
username@example.com

BILLING MANAGER
huey@example.com
dewey@example.com
```

ORG AUDITOR  
louie@example.com

- To list space users, run:

```
cf space-users ORG SPACE
```

Where:

- **ORG** is the name of the org that contains the space for which you want to see the list of users.
- **SPACE** is the name of the space for which you want to see the list of users.

The above command returns output similar to the example below:

```
Getting users in org example-org / space example-space as usernam
e@example.com...

SPACE MANAGER
username@example.com

SPACE DEVELOPER
huey@example.com
dewey@example.com

SPACE AUDITOR
louie@example.com
```

For more information about the `cf org-users` command, use `cf org-users --help`. For more information about the `cf space-users` command, use `cf space-users --help`.

## Manage roles

You use the commands listed below to manage roles in the cf CLI. These commands require admin permissions and take `username`, `org` or `space`, and `role` as arguments:

- `cf set-org-role`  
For more information, use `cf set-org-role --help`.
- `cf unset-org-role`  
For more information, use `cf unset-org-role --help`.
- `cf set-space-role`  
For more information, use `cf set-space-role --help`.
- `cf unset-space-role`  
For more information, use `cf unset-space-role --help`.

The available roles are:

- `OrgManager`
- `BillingManager`

- OrgAuditor
- SpaceManager
- SpaceDeveloper
- SpaceAuditor

For more information about user roles, see [Orgs, Spaces, Roles, and Permissions](#).

The following example shows the terminal output for `cf set-org-role huey@example.com example-org OrgManager`, which assigns the Org Manager role to `huey@example.com` within the `example-org` org:

```
Assigning role OrgManager to user huey@example.com in org example-org as user
name@example.com...
OK
```



If you are not an admin, you see this message when you try to run these commands:  
`error code: 10003, message: You are not authorized to perform the requested action`

## Manage roles for users with identical usernames in multiple origins

If a username corresponds to multiple accounts from different user stores, such as both the internal UAA store and an external SAML or LDAP store, running either `cf set-org-role` or `cf unset-org-role` returns an error similar to the following example:

```
The user exists in multiple origins. Specify an origin for the requested user
from: 'uaa', 'other'
```

To resolve this ambiguity, you can construct a `curl` command that uses the API to perform the desired role management function. For an example, see the [Cloud Foundry API documentation](#).

## Push an app

These sections describe how to use the `cf push` command to push a new app or sync changes to an existing app.

For more information about the `cf push` command, use `cf push --help`.

### Push a new app or push changes to an app

To push an app:

1. In a terminal window, log in to the cf CLI by running:

```
cf login
```

2. Go to the directory of the app.
3. Push a new app or push changes to an app by running:

```
cf push APP-NAME
```

Where `APP-NAME` is the name of the app.

## Push an app using a manifest

You can provide a path to a manifest file when you push an app. The manifest file includes information such as the name of the app, disk limit, and number of instances. You can use a manifest file rather than adding flags to the `cf push` command.

`cf push` locates the `manifest.yml` file in the current working directory by default. Alternatively, you can provide a path to the manifest with the `-f` flag.

For more information about the `-f` flag, see the `cf push --help` output.



When you provide an app name at the command line, the `cf push` command uses that app name instead of any app name provided in the manifest. If the manifest configures multiple apps, you can push a single app by providing the name at the command line; the cf CLI does not push the others. Use these behaviors for testing.

## Push an app with a buildpack

You can specify a buildpack when you push an app with the `-b` flag. If you use the `-b` flag to specify a buildpack, the app remains permanently linked to that buildpack. To use the app with a different buildpack, you must delete the app and then push it again.

For more information about available buildpacks, see the [Cloud Foundry documentation](#).

The following example shows the terminal output for `cf push awesome-app -b ruby_buildpack`, which pushes an app called `awesome-app` to the URL `http://awesome-app.example.com` and specifies the Ruby buildpack with the `-b` flag:

```
Pushing app awesome-app to org example-org / space development as username@example.com...
```

...

```
Waiting for app awesome-app to start...
```

```

name:          awesome-app
requested state:  started
routes:        awesome-app.example.com
last uploaded:  Wed 17 Jul 22:57:04 UTC 2024
stack:         cflinuxfs3
buildpacks:
  name      version  detect  output  buildpack name
  ruby_buildpack  1.8.58   ruby      ruby
type:          web
sidecars:
```

```
instances:      1/1
memory usage:   1024M
start command: bundle exec rackup config.ru -p $PORT -o 0.0.0.0
               state    since          cpu    memory    disk      log
ging          cpu entitlement details
#0  running   2024-07-17T22:57:22Z  0.3%  49.5M of 1G  130.2M of 1G  0B/
s of 16K/s  2.4%
```



To avoid security exposure, verify that you migrate your apps and custom buildpacks to use the `cflinuxfs4` stack based on Ubuntu 22.04 LTS (Jammy Jellyfish). The `cflinuxfs3` stack is based on Ubuntu 18.04 (Bionic Beaver), which reaches end of standard support in April 2023.

## Map a route to an app

You can provide a hostname for your app when you push the app. If you do not provide a hostname, the `cf push` command routes your app to a URL of the form `APP-NAME.DOMAIN`, where `APP-NAME` is the name of your app and `DOMAIN` is the default domain configured in the Cloud Foundry environment. The route definition is included in the `manifest.yml` file.

For information about mapping a route to your app, see [Routes and domains](#).

To map a route to the app:

1. In a terminal window, log in to the cf CLI by running:

```
cf login
```

2. Push and map a route by running:

```
cf push -f manifest.yml --var host=APP-HOSTNAME
```

Where:

- `APP-NAME` is the name of the app.
- `APP-DOMAIN` is the domain of the app.
- `APP-HOSTNAME` is the hostname of the app.

## Manage user-provided service instances

These sections describe how to create or update a service instance.

### Create a service instance

To create a new service instance, use the `cf create-user-provided-service` or `cf cups` commands. For more information about the `cf create-user-provided-service` and `cf cups` commands, use `cf create-user-provided-service --help`.

To create or update a user-provided service instance, you must supply basic parameters. For example, a database service might require a username, password, host, port, and database name.

You can provide these parameters in the following ways:

- Interactively. For more information, see [Supply Parameters Interactively](#) below.
- Non-interactively. For more information, see [Supply Parameters Non-Interactively](#) below.
- With third-party log management software as described in RFC 6587. For more information, see [Supply Parameters Through a Third Party](#) below and [RFC 6587](#).

When used with third-party logging, data is sent formatted according to RFC 5424. For more information, see [RFC 5424](#).

## Supply parameters interactively

To create a new service while supplying parameters interactively:

1. In a terminal window, log in to the cf CLI by running:

```
cf login
```

2. List parameters in a comma-separated list after the `-p` flag. Run:

```
cf cups SERVICE -p "PARAMETER, SECOND-PARAMETER, THIRD-PARAMETER"
```

Where:

- `SERVICE` is the name of the service you want to create.
- `PARAMETER`, `SECOND-PARAMETER`, and `THIRD-PARAMETER` are parameters such as username, password, host, port, and database name.

## Supply parameters non-interactively

To create a new service while supplying parameters non-interactively:

1. In a terminal window, log in to the cf CLI by running:

```
cf login
```

2. Pass parameters and their values in as a JSON hash, bound by single quotes, after the `-p` tag.

Run:

```
cf cups SERVICE -p '{"host":"HOSTNAME", "port":"PORT"}'
```

Where:

- `SERVICE` is the name of the service you want to create.
- `HOSTNAME` and `PORT` are service parameters.

## Supply parameters through a third party

For specific log service instructions, see [Streaming app logs to third-party services](#).

To create a service instance that sends data to a third party:

1. Log in to the cf CLI:

```
cf login
```

2. Create a service instance that sends data to a third party by running:

```
cf cups SERVICE -l THIRD-PARTY-DESTINATION-URL
```

Where:

- `SERVICE` is the name of the service you want to create.
- `THIRD-PARTY-DESTINATION-URL` is the external URL of the third-party service.

## Bind and unbind service instances

After you create a user-provided service instance, you can:

- Bind the service to an app with `cf bind-service`. For more information, use `cf bind-service --help`.
- Unbind the service with `cf unbind-service`. For more information, use `cf unbind-service --help`.
- Rename the service with `cf rename-service`. For more information, use `cf rename-service --help`.
- Delete the service with `cf delete-service`. For more information, use `cf delete-service --help`.

## Update a service instance

To update one or more of the parameters for an existing user-provided service instance, use `cf update-user-provided-service` or `cf uups`.

For more information about the `cf update-user-provided-service` and `cf uups` commands, use `cf create-user-provided-service --help`.

The `cf uups` command does not update any parameter values that you do not supply.

## Retrieve cf CLI return codes

The cf CLI uses exit codes, which help with scripting and confirming that a command has run successfully.

To view a cf CLI exit code:

1. In a terminal window, log in to the cf CLI by running:

```
cf login
```

2. To check that the login was successful, run one of these commands, depending on your OS:

- For macOS, run:

```
echo $?
```

- For Windows, run:

```
echo %ERRORLEVEL%
```

If the command succeeds, the exit code is 0.

## View CLI help output

The `cf help` command lists the cf CLI commands and a brief description of each..

To list detailed help for any cf CLI command, add the `--help` or `-h` flag to the command.

The example below shows detailed help output for the `cf delete` command:

```
NAME:
  delete - Delete an app

USAGE:
  cf delete APP_NAME [-f -r]

ALIAS:
  d

OPTIONS:
  -f      Force deletion without confirmation
  -r      Delete any mapped routes (only deletes routes mapped to a single
        app)
```

## Using the cf CLI with a proxy server

If you have an HTTP or SOCKS5 proxy server on your network between a host running the Cloud Foundry Command Line Interface (cf CLI) and your API endpoint, you must set the `https_proxy` variable with the hostname or IP address of the proxy server. The `https_proxy` environment variable holds the hostname or IP address of the proxy server.

The `https_proxy` variable is a standard environment variable. As with any environment variable, the specific steps used to set it depends on your operating system.

## Format of https\_proxy

The `https_proxy` variable is set with hostname or IP address of the proxy server in URL format, as shown in the following example:

```
https_proxy=http://proxy.example.com
```

If the proxy server requires a username and password, you must include the credentials, as shown in the following example:

```
https_proxy=http://username:password@proxy.example.com
```

If the proxy server uses a port other than 80, you must include the port number, as shown in the following example:

```
https_proxy=http://username:password@proxy.example.com:8080
```

If the proxy server is a SOCKS5 proxy, you must specify the SOCKS5 protocol in the URL, as shown in the following example:

```
https_proxy=socks5://socks_proxy.example.com
```

The `cf ssh` command for cf CLI v7+ does not work through a SOCKS5 proxy.

## Set https\_proxy in macOS or Linux

To set the `https_proxy` environment variable in macOS or Linux:

1. Use the command specific to your shell. For example, in bash, use the `export` command, as shown in the following example:

```
export https_proxy=http://my.proxyserver.com:8080
```

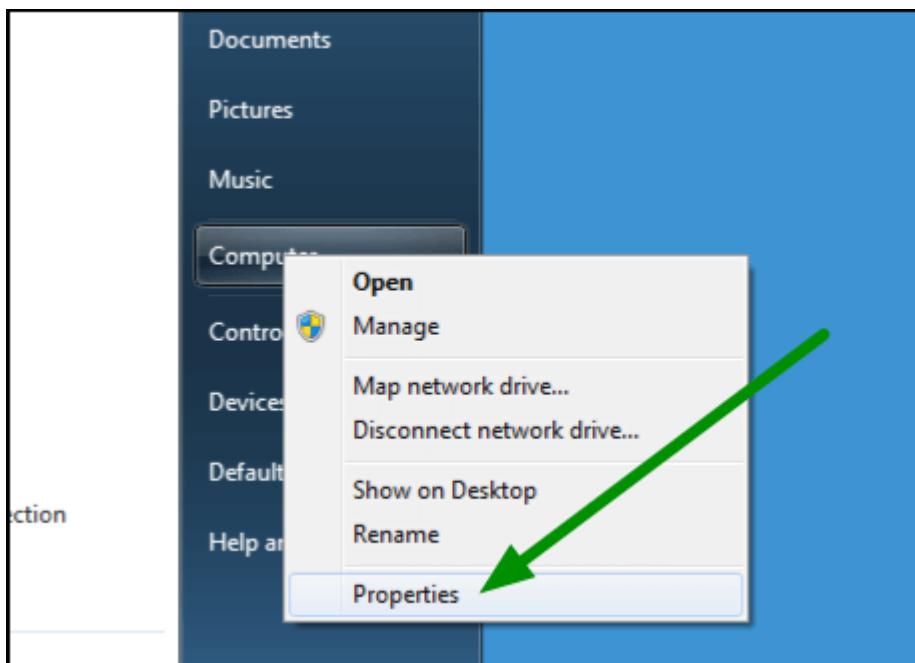
2. To make this change persistent, add the command to the appropriate profile file for the shell. For example, in bash, add a line similar to the following example to your `.bash_profile` or `.bashrc` file:

```
https_proxy=http://username:password@hostname:port
export $https_proxy
```

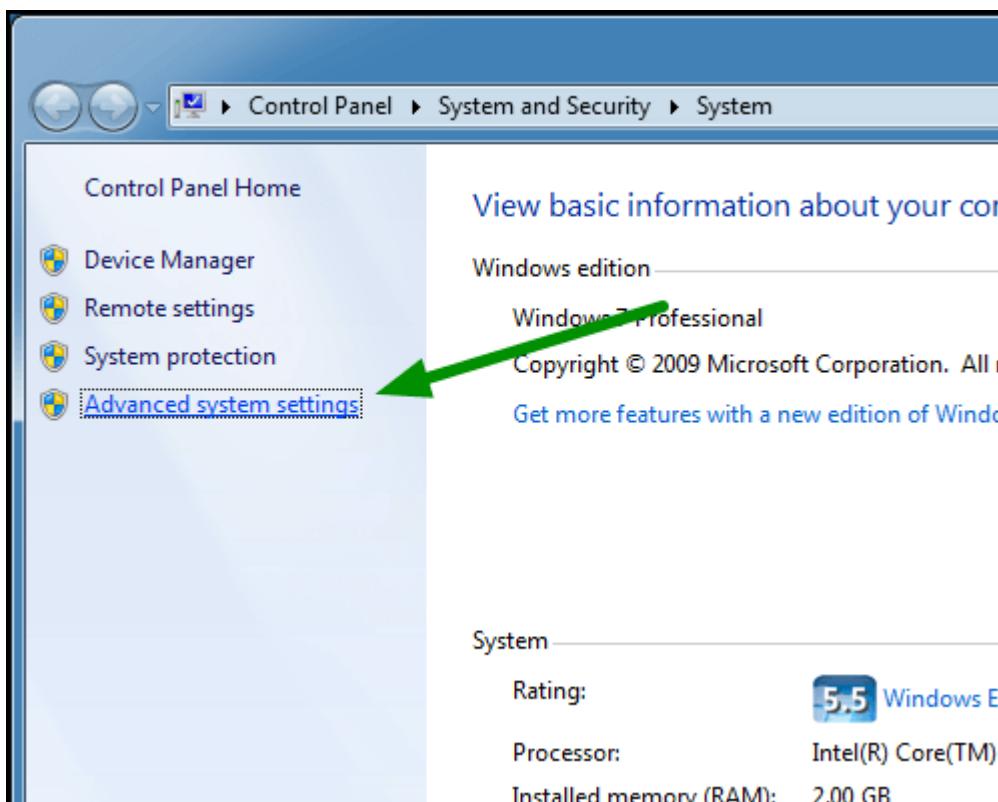
## Set https\_proxy in Windows

To set the `https_proxy` environment variable in Windows:

1. Open the **Start** menu.
2. Right-click **Computer** and select **Properties**.

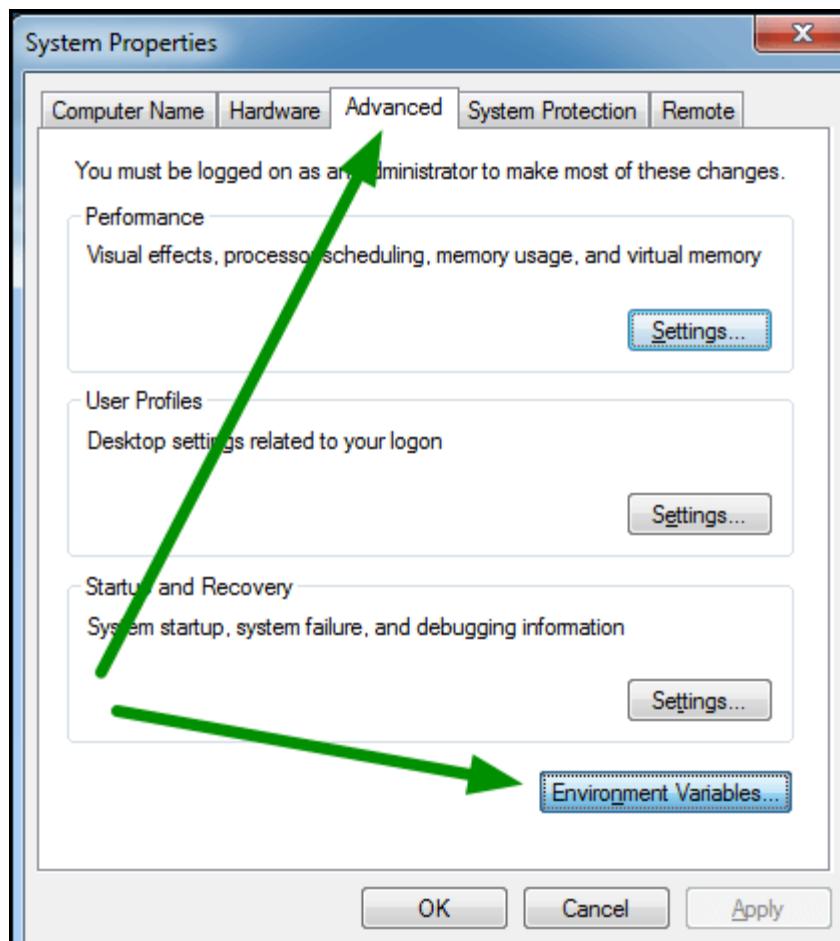


3. In the left pane of the **System** window, click **Advanced system settings**.

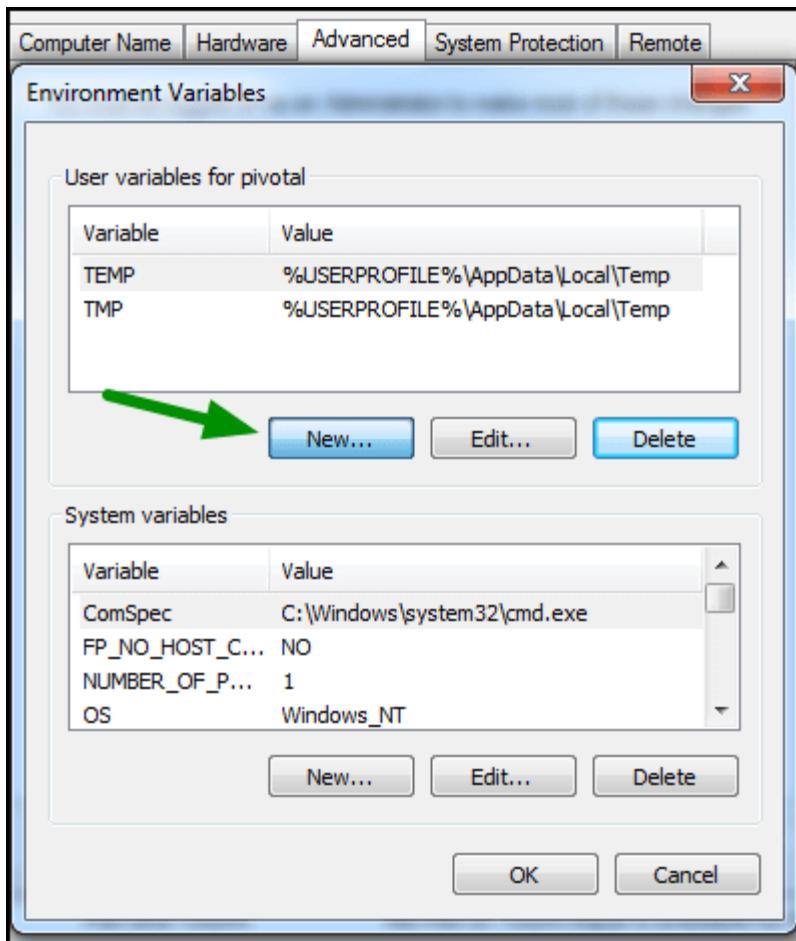


4. In the **System Properties** window:

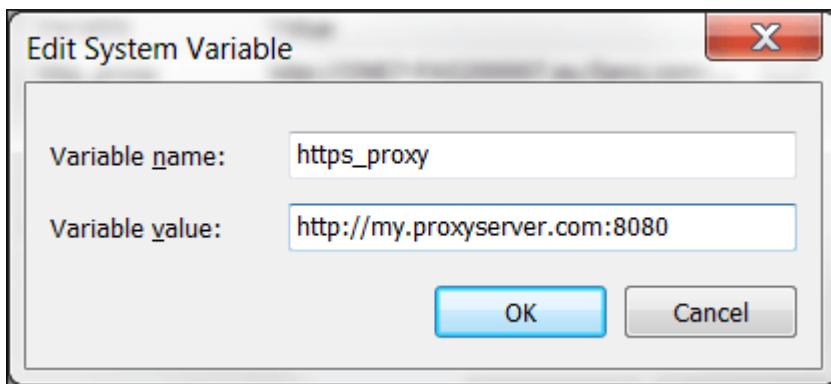
1. Select **Advanced**.
2. Click **Environment Variables**.



5. Under **User variables**, click **New**.



6. For **Variable name**, enter `https_proxy`.
7. For **Variable value**, enter your proxy server information.



8. Click **OK**.

## Using the cf CLI with a self-signed certificate

This topic describes how developers use the Cloud Foundry Command Line Interface (cf CLI) to communicate securely with a Cloud Foundry deployment that uses a self-signed certificate.

You can use the cf CLI to communicate securely with a Cloud Foundry deployment without specifying `--skip-ssl-validation` under the following conditions:

- The deployment uses a self-signed certificate.

- The deployment uses a certificate that is signed by a self-signed certificate authority (CA), or by an intermediate certificate that is also signed by a self-signed CA.

Before following the procedure below, the developer must obtain either the self-signed certificate or the intermediate and CA certificate(s) used to sign the deployment's certificate. The developer can obtain these certificates from the Tanzu Operations Manager operator.

## Installing the certificate on physical machines

The certificates you must insert into your local trust store vary depending on the configuration of your deployment:

- If the deployment uses a self-signed certificate, you must insert the self-signed certificate into your local trust store.
- If the deployment uses a certificate signed by a self-signed CA, or a certificate signed by a certificate that is signed by a self-signed CA, you must insert the self-signed certificate and any intermediate certificates into your local trust store.

## Installing the Certificate on macOS X

To place the certificate file `server.crt` into your local trust store for macOS X:

- Run:

```
sudo security add-trusted-cert -d -r trustRoot -k /Library/Keychains/System.keychain server.crt
```

## Installing the certificate on Linux

To place the certificate file `server.crt` into your trust store for Linux:

- Run one of the following commands, depending on your Linux distribution:

- For Debian, Ubuntu, or Gentoo, run:

```
cat server.crt >> /etc/ssl/certs/ca-certificates.crt
```

- For Fedora or RHEL, run:

```
cat server.crt >> /etc/pki/tls/certs/ca-bundle.crt
```

The previous examples set the certificate permanently on your machine across all users and require `sudo` permissions. To set the certificate only in your current terminal or script, run one of these commands:

- Option 1:

```
export SSL_CERT_FILE=PATH-TO-SERVER.crt
```

Where `PATH-TO-SERVER.crt` is the filepath of the `server.crt` certificate file.

- Option 2:

```
export SSL_CERT_DIR=PATH-TO-SERVER-DIRECTORY
```

Where `PATH-TO-SERVER-DIRECTORY` is the directory of the `server.crt` certificate file.

## Installing the certificate on Windows

To place the certificate file `server.crt` into your local trust store for Windows:

1. Right-click the certificate file.
2. Click **Install Certificate**.
3. Choose to install the certificate as the **Current User** or **Local Machine**.
4. From the certification store list, select **Trusted Root Certification Authorities**.

## Using a cf CLI plug-in

The Cloud Foundry CLI (cf CLI) includes plug-in capability. Plug-ins allow you to add custom commands to the cf CLI.

You can install and use the plug-in that Cloud Foundry developers and third-party developers create. For a current list of community-supported plug-ins, see the [Cloud Foundry Community CLI Plug-in page](#). For information about submitting your own plug-in, see the [Cloud Foundry CLI Plugin Repository \(CLIPR\)](#) repository on GitHub.



Plug-ins are not vetted for security or function. Use plug-ins at your own risk.

The cf CLI identifies a plug-in by binary filename, its developer defined plug-in name, and the commands that the plug-in provides. Use the binary filename only to install a plug-in. You use the plug-in name or a command for any other action.

The cf CLI uses case-sensitive commands, but plug-in management commands accept plug-in and repository names irrespective of their casing.

## Changing the plug-in directory

By default, the cf CLI stores plug-ins on your workstation in `$CF_HOME/.cf/plugins`, which defaults to `$HOME/.cf/plugins`.

To change the root directory of this path from `$CF_HOME`, you must set the `CF_PLUGIN_HOME` environment variable.

The cf CLI appends `.cf/plugins` to the `CF_PLUGIN_HOME` path that you specify and stores plug ins in that location. For example, if you set `CF_PLUGIN_HOME` to `/my-folder`, cf CLI stores plug-ins in `/my-folder/.cf/plugins`.

## Installing a plug-in

To install a plug-in:

1. Download a binary or the source code for a plug-in from a trusted provider.

The cf CLI requires a binary file compiled from source code written in Go. If you download source code, you must compile the code to create a binary.

2. Run:

```
cf install-plugin BINARY-FILENAME
```

Where `BINARY-FILENAME` is the path to and name of your binary file.

You cannot install a plug-in that has the same name or that uses the same command as an existing plugin. If you attempt to do so, you are prompted to uninstall the existing plugin.

The cf CLI prohibits you from implementing any plug-in that uses a native cf CLI command name or alias. For example, if you attempt to install a third-party plugin that includes the `cf push` command, the cf CLI halts the installation.

For more information, use `cf install-plugin --help`.

## Managing plug-ins and running plug-in commands

Use the contents of the `cf help` **CLI plug-in management** and **Commands offered by installed plug-ins** sections to manage plug-ins and run plug-in commands.

To manage plug-ins and run plug-in commands:

1. List all installed plug-ins and all commands that the plug-ins provide by running:

```
cf plugins
```

2. Run a plug-in command:

```
cf PLUGIN-COMMAND
```

Where `PLUGIN-COMMAND` is the plug-in command that you want to run.

## Checking for plug-in updates

To check all registered plug-in repositories for newer versions of currently installed plug-ins:

1. Run:

```
cf plugins --outdated
```

2. See the output of the previous command, in this example:

```
$ cf plugins --outdated
Searching CF-Community, company-repo for newer versions of installed pl
ugins...
plugin      version  latest version
coffeemaker 1.1.2    1.2.0
Use 'cf install-plugin' to update a plugin to the latest version.
```

For more information about the `cf plugins` command, use `cf plugins --help`.

## Uninstalling a plug-in

To uninstall a plug-in:

1. To view the names of all installed plug-ins, run:

```
cf plugins
```

2. Run:

```
cf uninstall-plugin PLUGIN-NAME
```

Where `PLUGIN-NAME` is the name of the plug-in you want to uninstall.

You must use the name of the plug-in, not the binary filename, to uninstall it.

For more information, use `cf uninstall-plugin --help`.

## Adding a plug-in repository

To add a plug-in repository:

1. Run:

```
cf add-plugin-repo REPOSITORY-NAME-URL
```

Where `REPOSITORY-NAME-URL` is the URL of the plug-in repository that you want to add.

For more information, use `cf add-plugin-repo --help`.

## Viewing available plug-in repositories

To view your available plug-in repositories:

1. Run:

```
cf list-plugin-repos
```

For more information, use `cf list-plugin-repos --help`.

## Listing all plug-ins by repository

To show all plug-ins from all available repositories:

1. Run:

```
cf repo-plugins
```

For more information, use `cf repo-plugins --help`.

## Troubleshooting

The cf CLI provides the following error messages to help you troubleshoot installation and usage issues. Third-party plug-ins provide their own error messages.

## Permission denied

If you receive a `permission denied` error message, you lack required permissions to the plug-in. You must have `read` and `execute` permissions to the plug-in binary file.

## Plug-in command collision

Plug-in names and commands must be unique. The CLI displays an error message if you attempt to install a plug-in with a non unique name or command.

If the plug-in has the same name or command as a currently installed plug-in, you must uninstall the existing plug-in to install the new plug-in.

If the plug-in has a command with the same name as a native cf CLI command or alias, you cannot install the plug-in.

## Developing cf CLI plug-ins

You can create and install Cloud Foundry Command Line Interface (cf CLI) plug-ins to provide custom commands. You can submit and share these plug-ins to the [CF Community repository](#).

### Prerequisite

To use plug-ins, you must use cf CLI v7 or later. For information about downloading, installing, and uninstalling cf CLI commands, see [Installing the Cloud Foundry Command Line Interface](#).

## Creating a plug-in

To prepare to create a plug-in:

1. Implement the predefined plug-in interface from [plugin.go](#) in the Cloud Foundry CLI repository on GitHub.
2. Clone the [Cloud Foundry CLI repository](#) from GitHub. To create a plug-in, you need the [basic GO plugin](#).

## Initializing the plug-in

To initialize a plug-in:

1. From within the `main()` method of your plug-in, call:

```
plugin.Start(new(MyPluginStruct))
```

The `plugin.Start(...)` function requires a new reference to the `struct` that implements the defined interface.

## Invoking cf CLI commands

To invoke cf CLI commands,

1. From within the `Run(...)` method of your plug-in, call:

```
cliConnection.CliCommand([]args)
```

The `Run(...)` method receives the `cliConnection` as its first argument. The `cliConnection.CliCommand([]args)` returns the output printed by the command and an error.

The output is returned as a slice of strings. The error occurs if the call to the cf CLI command fails.

For more information, see [Plug-in API](#) in the Cloud Foundry CLI repository on GitHub.

## Installing a plug-in

To install a plug-in:

1. Run:

```
cf install-plugin PATH-TO-PLUGIN-BINARY
```

Where `PATH-TO-PLUGIN-BINARY` is the path to your plug-in binary.

For more information about developing plug-ins, see [plugin\\_examples](#) in the Cloud Foundry CLI repository on GitHub.

# Observability

In this section:

- Logging and metrics
- Logging and metrics architecture
- Configuring the OpenTelemetry Collector (OTel)
- **Logging**
  - Configuring logging in TAS for VMs
  - App logging in TAS for VMs
  - Security event logging
  - Limiting your app log rate
  - Customizing platform log forwarding
- **Monitoring**
  - Monitoring TAS for VMs
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  - Identifying TAS for VMs jobs using vCenter
- **App metrics**
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  - Metric Registrar and custom app metrics
  - Using Metric Registrar
  - Identifying the source deployment of metrics
- **Performance and scaling**
  - Key performance indicators
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- **Reporting**
  - Reporting app, task, and service instance usage
  - Reporting instance usage with Apps Manager
- **Loggregator**
  - Loggregator guide for TAS for VMs operators
  - Deploying a nozzle to your Loggregator Firehose
  - Installing the Loggregator Firehose plug-in for cf CLI

# Logging and metrics in Cloud Foundry

You can use logging and metrics in VMware Tanzu Application Service for VMs (TAS for VMs). Learn about logs and metrics sources, and transport systems. It also lists products for viewing logs and metrics.

## Accessing metrics

You must use a Cloud Foundry Command-Line Interface (cf CLI) plug-in to access and view metrics directly from the command line. You can use either the Firehose plug-in or the Log Cache plug-in.

### Accessing metrics using the Log Cache CLI plug-in

To access metrics with the Log Cache plug-in:

1. Log in to the cf CLI by running:

```
cf login -a API-URL -u USERNAME -p PASSWORD
```

Where:

- `API-URL` is your API endpoint.
- `USERNAME` is your username.
- `PASSWORD` is your password.

2. Install the Log Cache CLI plug-in by running:

```
cf install-plug-in -r CF-Community "log-cache"
```

For more information, see [log-cache](#) in *cf CLI plug-ins* on the Cloud Foundry website.

3. Run:

```
cf query 'METRIC-NAME{source_id="SOURCE-ID"}'
```

Where:

- `METRIC-NAME` is the name of the metric you want to view.
- `SOURCE-ID` is the source ID of the component for which you want to view metrics.

To find the source ID and metric name of the metric you want to view, see [Key Performance Indicators](#) and [Key Capacity Scaling Indicators](#).

### Accessing metrics using the Firehose plug-in

To access metrics using the Firehose plug-in:

1. Log in to the cf CLI by running:

```
cf login -a API-URL -u USERNAME -p PASSWORD
```

Where:

- `API-URL` is your API endpoint.

- `USERNAME` is your username.
  - `PASSWORD` is your password.
2. Install the Firehose of CLI plug-in by running:

```
cf install-plugin -r CF-Community "Firehose Plugin"
```

For more information, see [Firehose plug-ins in cf CLI Plug-ins](#) on the Cloud Foundry website.

3. Run:

```
cf nozzle -no-filter | grep SOURCE-ID | grep -i METRIC-NAME
```

Where:

- `METRIC-NAME` is the name of the metric you want to view.
- `SOURCE-ID` is the source ID of the component for which you want to view metrics.

For example:

```
cf nozzle -no-filter | grep bbs | grep -i ConvergenceLRPDuration
```

Because metrics are scraped at different intervals, it might take up to fifteen minutes for the Firehose to receive all metrics for the component. Run `cf nozzle` again until you have received a complete set of metrics for a component. For more information, see [Firehose Architecture in Loggregator Architecture](#).

To find the source ID and metric name of the metric you want to view, see [Key Performance Indicators](#) and [Key Capacity Scaling Indicators](#).

For more information about nozzles, see [Nozzles in Logs, Metrics, and Nozzles](#) in the Tanzu Operations Manager Tile Developer Guide.

## Sources for logs and metrics

The following sources are for TAS for VMs logs and metrics:

- TAS for VMs platform components, such as a Diego Cell, MySQL Server, or Cloud Controller
- Apps and app containers deployed on TAS for VMs

The following table describes the data included in logs and metrics from each source:

Source	Logs data	Metrics data
Platform components	Logs from TAS for VMs components	<ul style="list-style-type: none"> <li>Health metrics from BOSH-deployed VMs<sup>1</sup></li> <li>Platform metrics from TAS for VMs components. For example, Diego Cell capacity remaining and Gorouter throughput.</li> <li>Metrics for any service tile that self-publishes to the Loggregator Firehose. For example, Redis and MySQL.</li> </ul>
Apps and app containers	Logs from apps <sup>2</sup>	<ul style="list-style-type: none"> <li>Container metrics<sup>3</sup></li> <li>Custom app metrics<sup>4</sup></li> </ul>

<sup>1</sup>For more information about using the BOSH Health Monitor to collect health metrics on VMs, see [Configuring a Monitoring System](#).

<sup>2</sup>For more information about app logging, see [App Logging in TAS for VMs](#).

<sup>3</sup>For more information about container metrics, see [Container Metrics](#).

<sup>4</sup>For more information about configuring an app to stream custom metrics to Loggregator, see [Metric Registrar and Custom App Metrics](#).

## Transport Systems for logs and metrics

The following transport systems deliver logs and metrics from their source to an observability product for viewing:

- Loggregator:** Loggregator is the transport system for both logs and metrics on apps deployed on TAS for VMs, as well as metrics on TAS for VMs platform components.

For more information about the Loggregator system, including Loggregator architecture and components, see [Loggregator Architecture](#) and for the types of envelopes being transported in Loggregator, see [Envelope Types](#).

- rsyslogd on TAS for VMs component VMs:** rsyslogd is the transport system for TAS for VMs component logs. Users can configure rsyslogd to transport component logs to a third-party syslog server.

The following table lists the transport system for logs and metrics on TAS for VMs platform components and apps:

Source	Logs transport system	Metrics transport system
Platform components	rsyslogd on TAS for VMs component VMs	Loggregator
Apps	Loggregator	Loggregator

## Viewing logs and metrics

The following table lists the products and tools for viewing TAS for VMs logs and metrics:

Source	Products and tools for viewing logs	Products and tools for viewing metrics
Platform components	To view system logs from TAS for VMs components, configure rsyslogd to transport logs to a third-party product.	You can use the following products or tools to view platform component and VM metrics: <ul style="list-style-type: none"> <li>• Loggregator Firehose CLI Plug in. See <a href="#">Installing the Loggregator Firehose plug-in for CLI</a>.</li> <li>• Loggregator Log Cache CLI plug-in. See <a href="#">Cloud Foundry Community cf CLI plug-ins</a>.</li> <li>• Healthwatch. See <a href="#">Healthwatch for VMware Tanzu</a>.</li> </ul>
Apps	You can use the following products or tools to view app logs: <ul style="list-style-type: none"> <li>• cf CLI cf logs command. See <a href="#">Cloud Foundry CLI Reference Guide</a>.</li> <li>• Apps Manager. See <a href="#">Managing Apps and Service Instances Using Apps Manager</a>.</li> <li>• Syslog forwarding. See <a href="#">Streaming App Logs to Log Management Services</a>.</li> <li>• Loggregator Firehose CLI plug-in. See <a href="#">Installing the Loggregator Firehose plug-in for CLI</a>.</li> <li>• Loggregator Log Cache CLI plug-in. See <a href="#">Cloud Foundry Community cf CLI plug-ins</a>.</li> </ul>	You can use the following products or tools to view app metrics: <ul style="list-style-type: none"> <li>• Loggregator Firehose CLI plug-in. See <a href="#">Installing the Loggregator Firehose plug-in for CLI</a>.</li> <li>• Loggregator Log Cache CLI plug-in. See <a href="#">Cloud Foundry Community cf CLI plug-ins</a>.</li> <li>• App Metrics. See the <a href="#">App Metrics documentation</a>.</li> </ul>

## Logging and metrics architecture

Logging and metrics architecture includes components that transport logs and metrics from your TAS for VMs deployment to destinations such as the Cloud Foundry Command-Line Interface (cf CLI), monitoring tools, or internal system components.

Depending on the configuration of your TAS for VMs deployment, your TAS for VMs deployment uses either a Loggregator Firehose architecture or a shared-nothing architecture.

In addition to the components in these architectures, you can also use a System Metrics Agents architecture on a Loggregator deployment to collect metrics from system components and expose them on Prometheus scrapable endpoints.

## Architecture reference diagrams

This section provides architecture diagrams that show the components that collect, store, and forward logs and metrics in your TAS for VMs deployment.

You can use these diagrams to:

- Understand the components that transport logs and metrics on your TAS for VMs deployment.

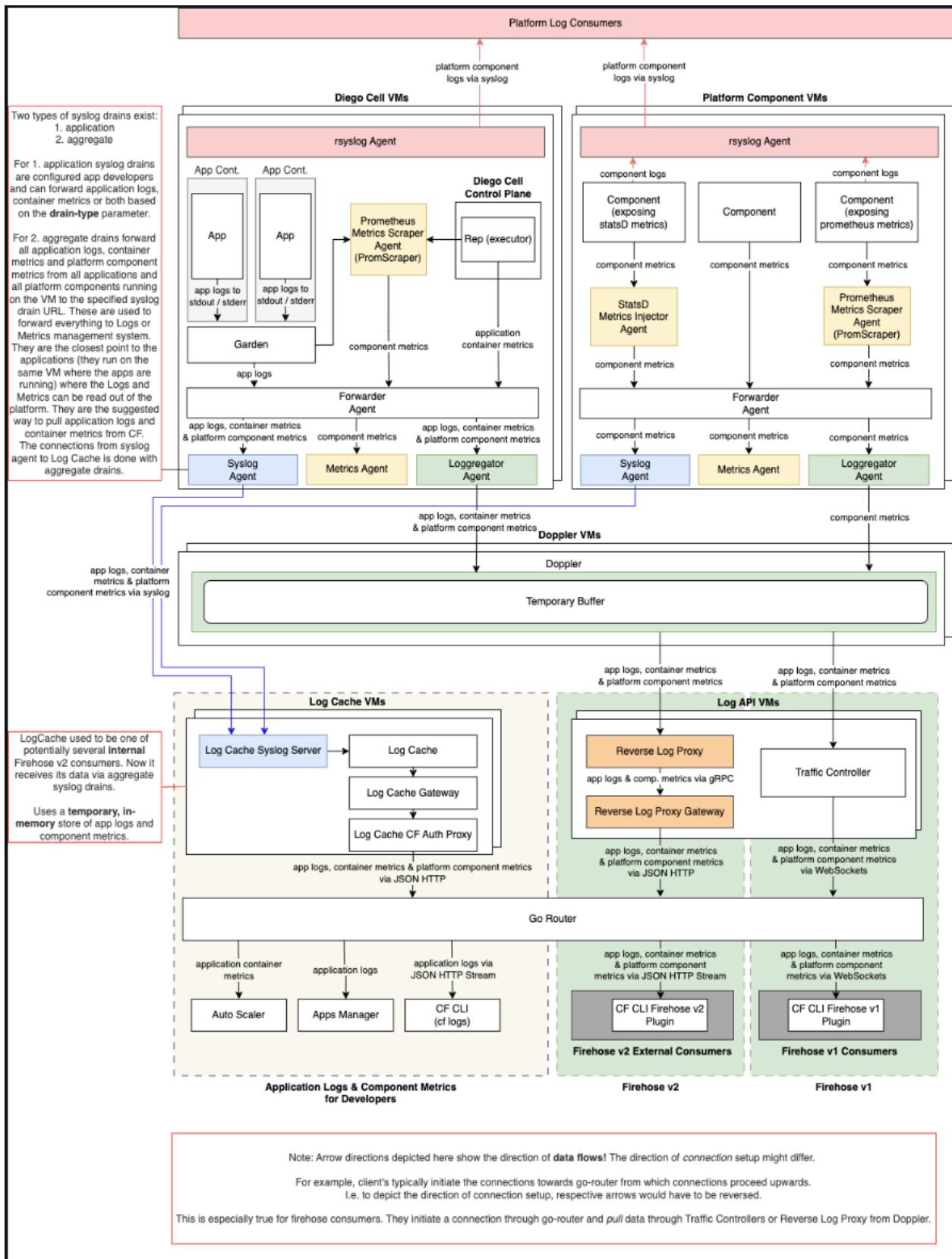
- Diagnose performance issues related to logging and metrics.
- Make decisions about how to best scale the components or consumers described in the architecture.

This section includes the following diagrams:

- Loggregator Firehose architecture. For more information, see [Loggregator Firehose Architecture](#).
- Shared-nothing architecture. For more information, see [Shared-nothing Architecture](#).
- System Metrics Agents architecture. For more information, see [System Metrics Agents Architecture](#).

## Loggregator Firehose architecture

The following diagram shows how logs and metrics are transported from components and apps on your deployment to Loggregator Firehose consumers, such as nozzles, monitoring tools, or third-party software.



[View a larger version of this image.](#)

The following components are included in the Loggregator Firehose architecture, as shown in the previous diagram:

- **Prom Scraper:** Prometheus Scrapers run on both component VMs and Diego Cell VMs. They aggregate metrics from components located on those VMs through Prometheus exposition. Prom

Scrapers then forward the metrics to Forwarder Agents.

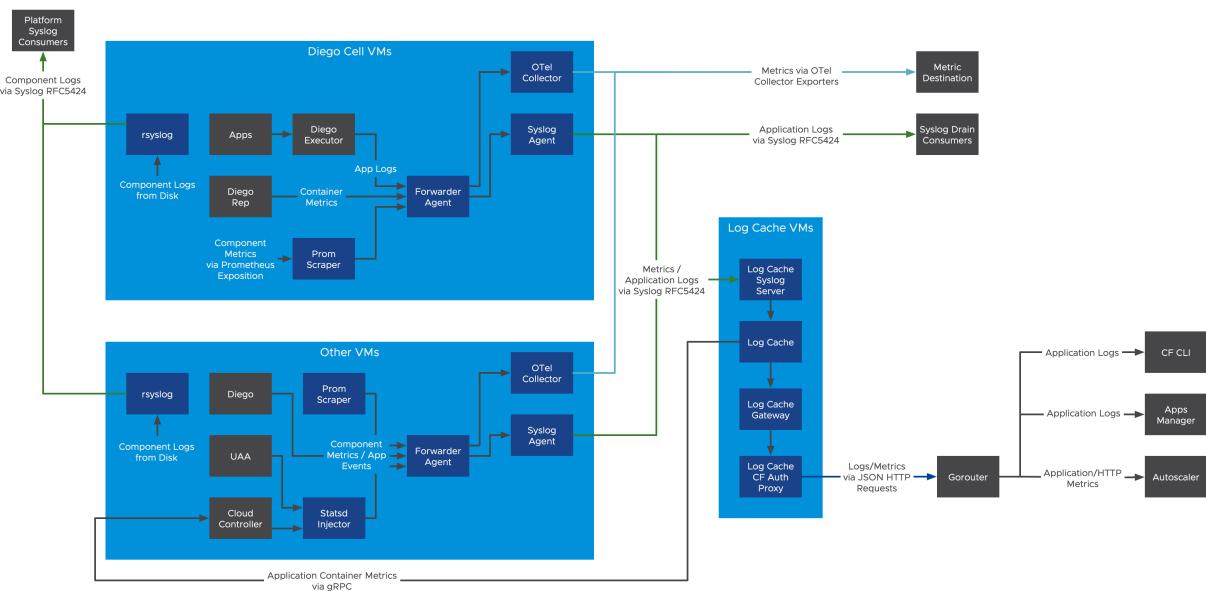
- **Statsd Injector:** Statsd Injectors run on component VMs. They receive metrics from components over the Statsd protocol. Statsd Injectors then forward the metrics to Forwarder Agents.
- **Forwarder Agent:** Forwarder Agents run on both component VMs and Diego Cell VMs. They receive logs and metrics from the apps and components located on those VMs. Forwarder Agents then forward the logs and metrics to Loggregator Agents and other agents.
- **Loggregator Agent:** Loggregator Agents run on both component VMs and Diego Cell VMs. They receive logs and metrics from the Forwarder Agents, then forward the logs and metrics from multiple Dopplers.
- **Doppler:** Dopplers receive logs and metrics from Loggregator Agents, store them in temporary buffers, and forward them to Traffic Controllers and Reverse Log Proxies.
- **Traffic Controller:** Traffic Controllers poll Doppler servers for logs and metrics, then translate these messages from the Doppler servers as necessary for external and legacy APIs. It services the Firehose Endpoint, also known as the V1 Firehose. The Firehose cf CLI plug-in allows you to view the output of the Firehose. For more information about the Firehose plug-in, see [Installing the Loggregator Firehose plug-in for cf CLI](#).
- **Reverse Log Proxy (V2 Firehose):** Reverse Log Proxies (RLPs) collect logs and metrics from Dopplers and forward them to Log Cache and other consumers over gRPC. Operators can scale up the number of RLPs based on overall log volume.
- **Reverse Log Proxy Gateway (V2 Firehose):** Reverse Log Proxies Gateways (RLP Gateways) collect logs and metrics from Reverse Log Proxies and forward them to consumers over HTTP. Collecting logs and metrics through the RLP Gateway has lower throughput compared to consuming from the Traffic Controller or Reverse Log Proxy.
- **Log Cache:** Log Cache allows viewing of logs and metrics over a specified period of time. The Log Cache includes API endpoints and a CLI plug-in to query and filter logs and metrics. To download the Log Cache CLI plug-in, see [Cloud Foundry Plug-ins](#). The Log Cache API endpoints are available by default. For more information about using the Log Cache API, see [Log Cache on GitHub](#).
- **Log Cache Syslog Server:** The Log Cache Syslog Server receives logs and metrics from Syslog Agents and sends them to Log Cache.

## Shared-nothing architecture

This section describes the components in the shared-nothing architecture that collect, store, and transport logs and metrics on your deployment.

Similar to the Loggregator Firehose Architecture, the shared-nothing architecture allows you to forward logs and metrics from your deployment to external and internal consumers.

In contrast to the Loggregator Firehose architecture, logs and metrics pass through fewer components in the shared-nothing architecture.



[View a larger version of this image.](#)

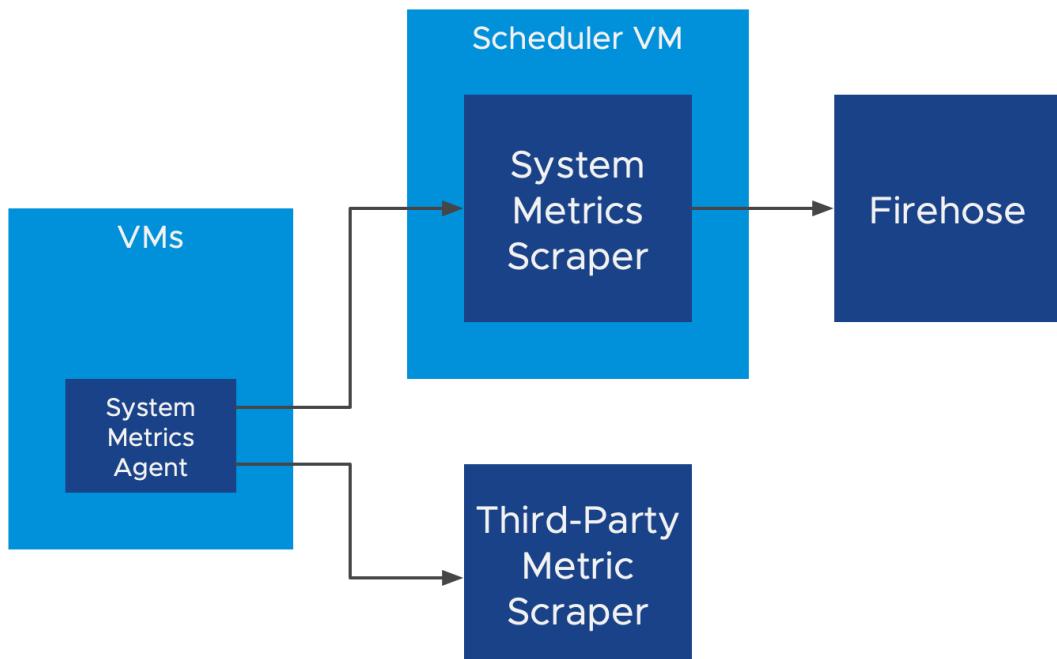
The following components are included in the shared-nothing architecture, as shown in the previous diagram:

- **Prom Scraper:** Prom Scrapers run on both TAS for VMs component VMs and Diego Cell VMs. They aggregate metrics from TAS for VMs components located on those VMs through Prometheus exposition. Prom Scrapers then forward those metrics to Forwarder Agents.
- **Statsd Injector:** Statsd Injectors run on TAS for VMs component VMs. They receive metrics from TAS for VMs components over the Statsd protocol. Statsd Injectors then forward those metrics to Forwarder Agents.
- **Forwarder Agent:** Forwarder Agents run on both TAS for VMs component VMs and Diego Cell VMs. They receive logs and metrics from the apps and TAS for VMs components located on those VMs. Forwarder Agents then forward the logs and metrics to Loggregator Agents and other agents.
- **Syslog Agent:** Syslog Agents run on Operations Manager VMs to collect and forward logs to configured syslog drains. You can specify the destination for logs when defining the individual syslog drain bound to an application or in the TAS for VMs configuration for all apps in your foundation as an aggregate drain. You can also set the drain scope. Any VM running a syslog agent may connect to configured syslog drains: including Diego Cells, Routers, and Cloud Controllers.
- **Syslog Binding Cache (not pictured):** Syslog Agents can overwhelm CAPI when querying for existing bindings. To address this, the Syslog Binding Cache is a caching proxy between the Syslog Agents and CAPI.
- **Metrics Discovery Registrars:** Metrics Discovery Registrars register each scrapeable endpoint with NATS for discovery by Metrics Scrapers.
- **Log Cache:** Log Cache allows viewing of logs and metrics over a specified period of time. The Log Cache includes API endpoints and a CLI plug-in to query and filter logs and metrics. To download the Log Cache CLI plug-in, see [Cloud Foundry Plug-ins](#). The Log Cache API endpoints are available by default. For more information about using the Log Cache API, see [Log Cache](#) on GitHub.
- **Log Cache Syslog Server:** The Log Cache Syslog Server receives logs and metrics from Syslog Agents and sends them to Log Cache.

- **OTel Collector (experimental):** OpenTelemetry Collectors are configured to receive metrics from Forwarder Agents and send them to external drains using a variety of available formats.

## System Metrics Agents architecture

The following diagram shows the architecture of a deployment that uses System Metrics Agents to collect VM and system-level metrics.



[View a larger version of this image.](#)

The following describes the components of a Loggregator deployment that uses System Metrics Agents, as shown in the previous diagram:

- **System Metrics Agent:** A standalone agent to provide VM system metrics using a Prometheus-scrapeable endpoint.
- **System Metrics Scraper:** The System Metrics Scraper forwards metrics from System Metrics Agents to Loggregator Agents over mTLS.

## How components transport logs and metrics

This section provides detailed descriptions of how the components in the Loggregator Firehose architecture and in the shared-nothing architecture transport logs and metrics on your deployment.

It describes the transport of logs and metrics during the following phases:

- How components in the logging and metrics architectures collect and forward metrics from VMs on your deployment. For more information, see [How logs and metrics egress from VMs](#).
- How components in a Loggregator Firehose architecture collect and forward logs and metrics. For more information, see [How Loggregator Firehose forwards logs and Metrics](#).
- How the logging and metrics architectures expose logs and metrics to consumers. For more information, see [How consumers receive logs and metrics](#).

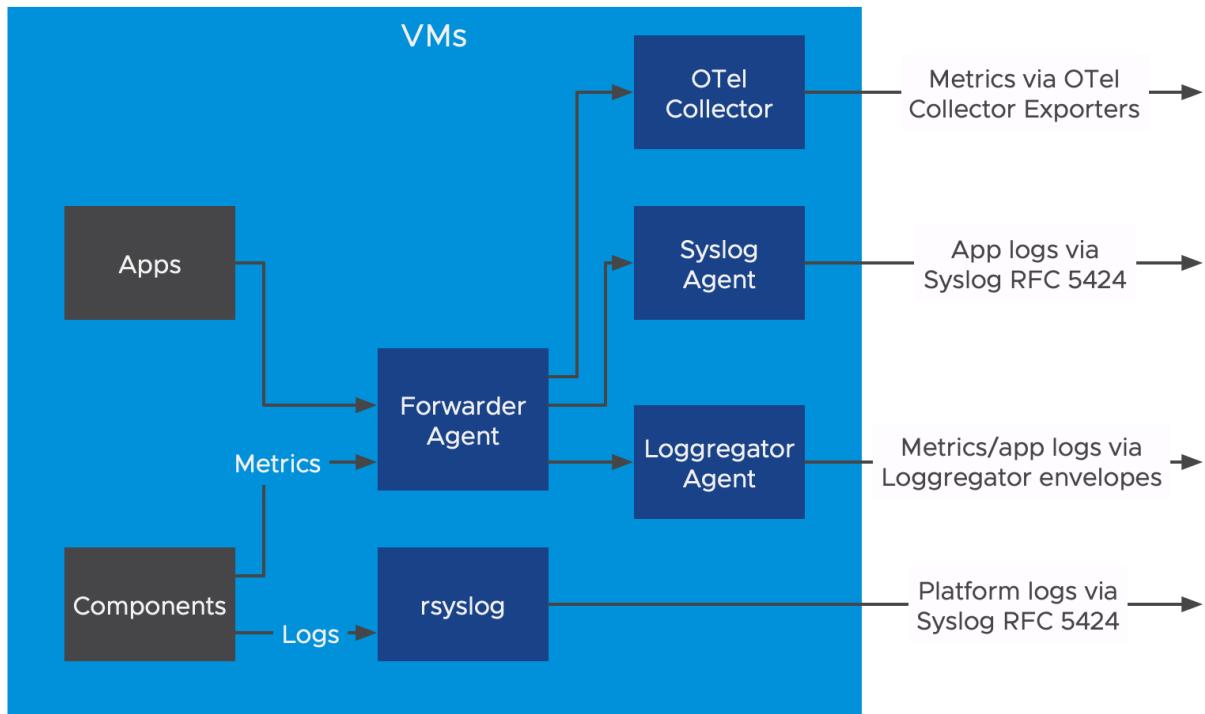
## How logs and metrics egress from VMs

The following describes the transport of logs and metrics from VMs through system components to a destination:

1. Apps and component VMs on your deployment emit logs and metrics.
2. Logs and metrics pass through two forwarders:
  - rsyslog: This sends logs from the component VMs in Syslog RFC 5424 format.
  - Forwarder Agent: This sends metrics and app logs to the Syslog Agent and the Loggregator Agent.
3. From the Forwarder Agent, logs and metrics then pass through each of the following agents:
  - Syslog Agent: This sends app logs in Syslog RFC 5424 format to aggregate and app log destinations.
  - Loggregator Agent: This sends metrics and app logs to the Loggregator Firehose.
  - OTel Collector (experimental): This sends app and component metrics in a variety of formats to aggregate metric destinations.

For more information about how logs and metrics flow through the Loggregator Firehose, see [How Loggregator Firehose forwards logs and metrics](#).

The following diagram shows the transport of logs and metrics from VMs on your deployment:



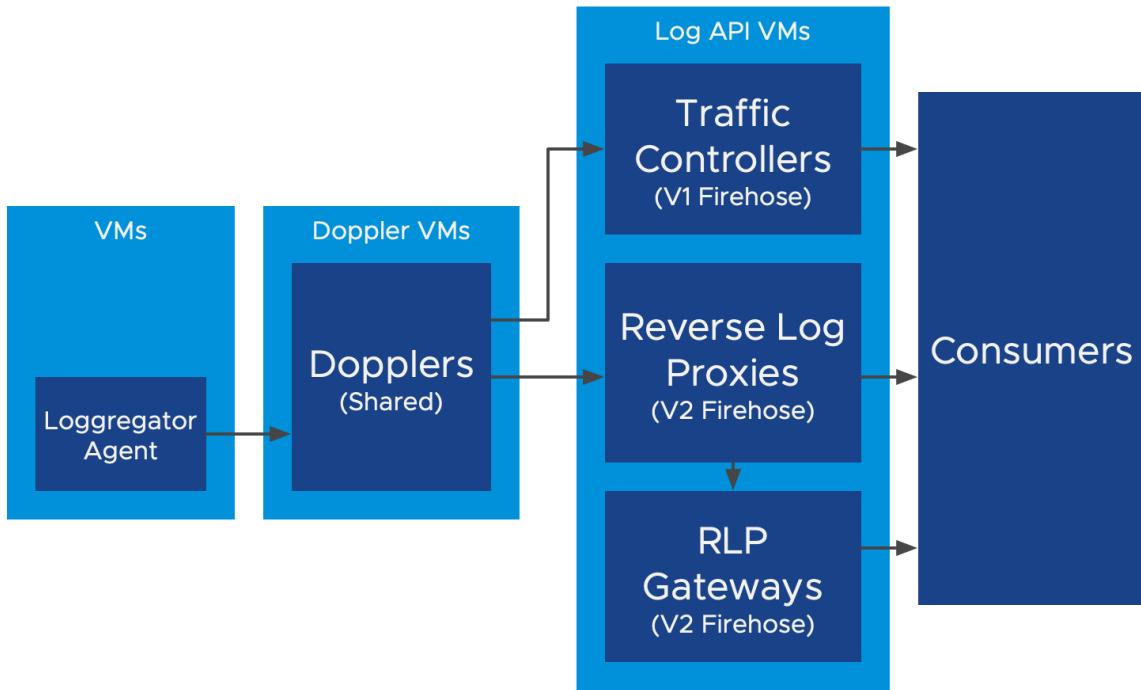
## How Loggregator Firehose forwards logs and metrics

For deployments that use a Loggregator Firehose architecture, the Loggregator Agent forwards logs and metrics emitted by apps and component VMs on your deployment to the Loggregator Firehose.

The following information describes how the Loggregator Firehose sends logs and metrics through the V1 and V2 Firehose APIs:

1. The Loggregator Agent sends each log and metric to one Doppler. It distributes the logs and metrics among a random group of five Doplplers.
2. Doplplers make a copy of each log and metric for each consumer. The Doplplers then send the logs and metrics to Traffic Controllers and Reverse Log Proxies for distribution.
3. Traffic Controllers and Reverse Log Proxies distribute logs and metrics in the following ways:
  - Traffic Controllers receive WebSocket connections from V1 Firehose Consumers, and send logs and metrics as V1 Envelopes. If any of these consumers start to fall behind, Traffic Controllers log a slow consumer alert and disconnect that particular consumer.
  - Reverse Log Proxies receive gRPC connections from V2 Firehose Consumers and send logs and metrics as V2 Envelopes. If a consumer falls behind, the envelopes are dropped.
  - Reverse Log Proxy Gateways (RLP Gateways) receive HTTP connections from V2 Firehose consumers, and send logs and metrics as JSON-encoded V2 Envelopes. Reverse Log Proxy Gateways connect to Reverse Log Proxies, rather than directly to Doplplers.

The following diagram shows the flow of logs and metrics through the Loggregator Firehose as previously described:



## How consumers receive logs and metrics

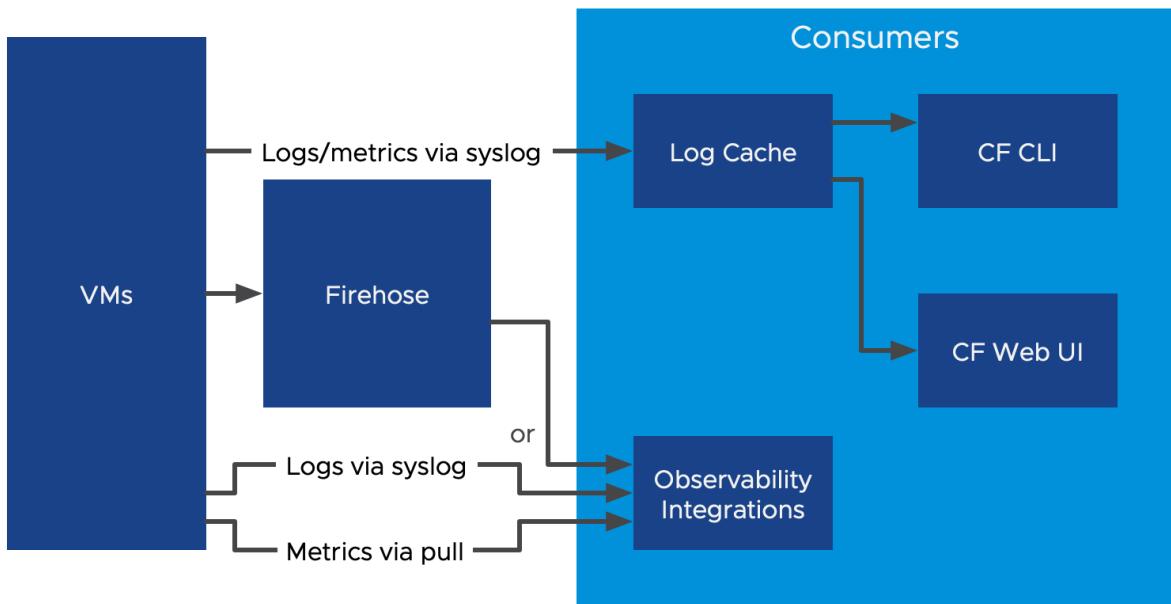
Consumers of logs and metrics include the Cloud Foundry Command Line Interface (cf CLI), Cloud Foundry web UIs such as Stratos, and any observability or monitoring product integrations.

The cf CLI and any Cloud Foundry web UIs can access logs and metrics through Log Cache. Log Cache receives logs and metrics from either the Firehose or directly from VMs through syslog. Log Cache provides short-term storage for logs and metrics where the cf CLI and web UIs can access them.

Integrations with observability or monitoring products receive logs and metrics through one of the following methods, depending on the logging and metrics architecture that your deployment uses:

- Connect to the Loggregator Firehose for access to both logs and metrics.
- Receive logs in syslog RFC 5424 format and metrics in OTel Collector-supported formats.

The following diagram shows how consumers of logs and metrics receive logs and metrics from your deployment:



## Related BOSH components

This section describes the components that forward BOSH reported VM metrics to Loggregator. BOSH-reported VM metrics measure the health of BOSH-deployed VMs on which apps and components are deployed. Loggregator streams BOSH-reported VM metrics through the Firehose.

The following components send BOSH reported VM metrics to Loggregator:

- **BOSH Agent:** BOSH Agents are located on component VMs and Diego Cell VMs. They collect metrics, such as Diego Cell capacity remaining, from the VM and forward them to the BOSH Health Monitor.
- **BOSH Health Monitor:** The BOSH Health Monitor receives metrics from the BOSH Agents. It then forwards the metrics to a third-party service or to the BOSH System Metrics Forwarder.
- **BOSH System Metrics Plugin:** This plug-in reads health events. For example, VM heartbeats and alerts from the BOSH Health Monitor, and streams them to the System Metrics Agent.
- **BOSH System Metrics Forwarder:** The BOSH System Metrics Forwarder is located on the Loggregator Traffic Controller. It forwards heartbeat events from the System Metrics Agent as envelopes to Loggregator through a Loggregator Agent.

## Configuring the OpenTelemetry Collector

You can deploy an [OpenTelemetry Collector](#) for TAS for VMs to egress traces, metrics, and logs.



The OpenTelemetry Collector is supported in TAS for VMs v6.0.13 and later.

When the OpenTelemetry (OTel) Collector is deployed, the Loggregator Forwarder Agent forwards platform and application metrics to the OTel Collector, which then processes traces, metrics, and logs using one or more pipelines that you configure.

The OTel Collector has a standard YAML-based file format for configuration.

The structure of TAS for VMs configuration file consists of three classes of pipeline components that access telemetry data:

- [Exporters](#)
- [Receivers](#)
- [Processors](#)

After each pipeline component is configured, add it in the `service.pipelines` section of the Collector configuration file.

## Exporter configuration

For example, to configure the OpenTelemetry Collector to egress metrics using OTLP over gRPC, you can provide the following minimal configuration. This will use the defaults for gRPC and TLS configuration.

```
otlp:
  endpoint: 203.0.113.10:4317
```

As the OTel Collector is deployed on all VMs in Cloud Foundry, you must ensure that all VMs in your deployment are allowed to connect to the OTLP server endpoint.

## Included exporters

Exporter	Stability
<code>otlpexporter</code>	stable
<code>nopexporter</code>	beta
<code>fileexporter</code>	alpha
<code>prometheusexporter</code>	stable
<code>prometheusremotewriteexporter</code>	beta
<code>splunkhecexporter</code>	beta

## mTLS

To configure the exporter to use an mTLS connection to the remote OTLP endpoint, you can specify additional TLS configuration.

```
otlp:
  endpoint: 203.0.113.10:4317
  tls:
    cert_pem: |
      PEM_ENCODED_CERTIFICATE
    key_pem: |
      PEM_ENCODED_PRIVATE_KEY
    ca_pem: |
      PEM_ENCODED_CERTIFICATE
```

## Multiple exporters

The OTel Collector supports defining multiple exporters, each with its own configuration. For example, you can define two OTLP gRPC exporters that egress metrics to different destinations.

```
otlp:
  endpoint: 203.0.113.10:4317
otlp/another:
  endpoint: 203.0.113.11:4317
```

## Receiver configuration

Currently, users should not list receivers and include them in the pipeline. By default, receivers are replaced with OTLP receiver that forwarder agent sends to automatically.

## gRPC compression

You can configure the type of compression used for OTLP gRPC exporters or receivers. The OTLP gRPC exporter uses `gzip` compression by default. To reduce CPU usage of the OTel Collector (increasing the size of the payload) you can optionally configure the OTLP gRPC exporter to use `snappy` compression. Validate that the server you are sending metrics to support `snappy` compression before making this change.

```
otlp:
  endpoint: 203.0.113.10:4317
  compression: snappy
```

## Processor configuration

Processors are used at various stages of a pipeline to pre-processes data before it is exported. By default, no processors are enabled. The order of the processors in a pipeline determines the order of the processing operations that the Collector applies to the signal.

Refer to the individual processor [documentation](#) for more information.

Currently, the TAS for VMs distribution of the OpenTelemetry Collector supports the following processors out of the box: `batch`, `memorylimiter`. You can configure processors using the `processors` section of the Collector configuration file.

```
processors:
  batch:
```

## Included processors

Processor	Stability
<code>batchprocessor</code>	stable
<code>memorylimiterprocessor</code>	stable
<code>transformprocessor</code>	alpha
<code>filterprocessor</code>	alpha

## Authentication

The TAS for VMs distribution of the OpenTelemetry Collector does not currently include any authenticator extensions. Please let us know in the [Cloud Foundry Slack #logging-and-metrics](#) channel if there are authenticator extensions you would find useful.

## Reviewing the available components

The TAS for VMs distribution of the OpenTelemetry Collector ships with a number of components. To see the components that are available for use, run the following command on a VM that has `otel-collector` deployed.

```
/var/vcap/packages/otel-collector/otel-collector components
```

## Service section

The `service` section is used to configure what components are enabled in the Collector based on the configuration found in the receivers, processors, exporters, and extensions sections. If a component is configured, but not defined referenced the `service` section, then it's not enabled.

The service section consists of two subsections: \* [Extensions](#) \* [Pipelines](#)

### Extensions

You can enable desired extensions using `extensions` subsections:

```
service:
  extensions: [zpages]
```

### Pipelines

A pipeline is a set of components used to process a signal. Before including a receiver, processor, or exporter in a pipeline, make sure to define its configuration in the appropriate section.

You can use the same receiver, processor, or exporter in more than one pipeline. When a processor is referenced in multiple pipelines, each pipeline gets a separate instance of the processor.

The following is an example of pipeline configuration. Note that the order of processors dictates the order in which data is processed:

```

service:
  extensions: [zpages]
pipelines:
  traces:
    receivers: [otlp/test]
    processors: [batch]
    exporters: [otlp]
  metrics:
    receivers: [otlp/test]
    processors: [batch]
    exporters: [otlp]

```

## Example config

Below is an example config structure:

```

receivers:
  otlp/test:
    protocols:
      grpc:

processors:
  batch:

exporters:
  otlp:
    endpoint: otelcol:4317

extensions:
  zpages:

service:
  extensions: [zpages]
  pipelines:
    traces:
      receivers: [otlp/test]
      processors: [batch]
      exporters: [otlp]
    metrics:
      receivers: [otlp/test]
      processors: [batch]
      exporters: [otlp]

```

## Deploying the OpenTelemetry Collector

Under the **System Logging** tab, you can configure your processors, exporters, and pipelines in the **OpenTelemetry Collector Configuration** field. Enter the YAML configuration into that text box.

## Logging

In this section:

- [Configuring logging in TAS for VMs](#)
- [App logging in TAS for VMs](#)

- Security event logging
- App log rate limiting
- Customizing platform log forwarding

## Configuring logging in TAS for VMs

VMware Tanzu Application Service for VMs (TAS for VMs) generates many logs. Learn about the log types and how to forward system logs to an external aggregator service, how to scale Loggregator component VMs to keep up with app log volume, and how to manage app traffic logging.

For more information about Loggregator components, see [Loggregator architecture](#).

## System logs, app logs, app traffic logs

TAS for VMs generates two types of logs, *system logs* from TAS for VMs components and *app logs* from hosted apps, as differentiated in the table below:

Log type	Originate from	Follow format	Stream from	Can stream out to (configurable)	Visible to
<b>System logs</b>	Platform components	Syslog standard	rsyslog agent	Component syslog drain	Operators
<b>App logs</b>	Hosted apps	Format is up to the developer	Firehose <sup>1</sup>	External data platform, optionally by using nozzles	Developers and Operators
		Converted to syslog standard	Syslog Agent	External syslog drain	

<sup>1</sup>The Loggregator Firehose also streams component metrics.

**App traffic logs are system logs.** When app containers communicate, or attempt to communicate, their host Diego Cells generate *app traffic logs*. App traffic logs are system logs, not app logs. These logs come from host Diego Cells, not apps, and they carry no information from within the app. App traffic logs only show app communication behavior, as detected from outside by the host Diego Cell.

## Log cache

Log Cache is a Loggregator feature that you can filter and query app logs through a CLI plug-in or API endpoints. Cached app logs are available on demand. You do not need to stream them continuously.

### Example uses of the Log Cache CLI plug-in

To access cached logs with the Log Cache CLI plug-in, you must first download and install the plug-in.

To download the Log Cache CLI plug-in, see the [cf CLI plug-ins](#) page on the Cloud Foundry website.

After you have installed the plug-in, the basic command to access cached app logs is:

```
cf tail OPTIONS APP-NAME-OR-ID
```

Where:

- `OPTIONS` are the flags you use to filter app logs.
- `APP-NAME-OR-ID` is the name or source ID of your app.

Some flags you can use Log Cache to filter app logs are:

- `--start-time`: Displays the start of the cache or the start of a time period you specify. Results display as a UNIX timestamp, in nanoseconds. Pair with `--end-time` to view logs within a time period.
- `--end-time`: Displays the end of the cache or the end of a time period you specify. Results display as a UNIX timestamp, in nanoseconds. Pair with `--start-time` to view logs within a time period.
- `--json`: Output logs in JSON.
- `--follow`: Append exported logs to `stdout`.

For more information about using the Log Cache CLI, see [Log Cache CLI: Usage](#) on GitHub.

## Example uses of the Log Cache API

The Log Cache API is hosted on TAS for VMs, and references your system domain to return responses. The root URL for API calls is `https://log-cache.SYSTEM-DOMAIN`, where `SYSTEM-DOMAIN` is your system domain.

The basic call to access and filter cached app logs is:

```
GET https://log-cache.SYSTEM-DOMAIN/v1/read/APP-ID
```

Where:

- `SYSTEM-DOMAIN` is your system domain.
- `APP-ID` is the source ID of your app.

Append the following parameters to your `GET` call to customize app logs:

- `start_time`: Displays the start of the cache or the start of a time period you specify. Results display as a UNIX timestamp, in nanoseconds. Pair with `end_time` to view logs within a time period.
- `end_time`: Displays the end of the cache or the end of a time period you specify. Results display as a UNIX timestamp, in nanoseconds. Pair with `start_time` to view logs within a time period.
- `envelope_types`: Filters by Envelope Type. The available filters are: `LOG`, `COUNTER`, `GAUGE`, `TIMER`, and `EVENT`. Set an envelope type filter to emit logs of only that type. Specify this parameter multiple times to include more types.
- `limit`: Sets a maximum number of envelopes to request. The max limit is 1000. This value defaults to 100.

More API parameters are available to customize retrieved app logs. For more information, see [Log Cache: RESTful API Gateway](#).

## Activate syslog forwarding

In the **System Logging** pane, you can configure system logging in TAS for VMs to forward log messages from TAS for VMs component VMs to an external service. VMware recommends forwarding logs to an external service for use in troubleshooting. If you do not fill these fields, platform logs are not forwarded but remain available on the component VMs and for download through Tanzu Operations Manager.



This procedure explains how to configure system logging for TAS for VMs component VMs. To forward logs from Operations Manager tiles to an external service, you must also configure system logging in each tile. For more information about configuring system logging, see the documentation for the given tiles.

To configure the **System Logging** pane:

1. Select **System Logging**.
2. For **Syslog server address**, enter the hostname or IP address of the syslog server.
3. For **Syslog server port**, enter the port of the syslog server. The default port for a syslog server is [514](#).



The host must be reachable from the TAS for VMs network and accept UDP or TCP connections. Ensure that the syslog server listens on external interfaces.

4. For **Transport protocol**, select a transport protocol for log forwarding.
5. (Optional) For **Environment identifier**, enter a custom label (e.g. the name of your foundation) to include in the structured data of forwarded syslog messages with the parameter name [environment](#).
6. For **TLS encryption**, select one of the following options:
  - **Use:** Configures TAS for VMs to use TLS encryption when forwarding logs to a remote server. If you select this option, configure the following fields:
    1. For **Permitted peer**, enter either the name or SHA1 fingerprint of the remote peer.
    2. For **CA certificate**, enter the CA certificate for the remote server.
  - **Do not use:** TAS for VMs does not use TLS encryption when forwarding logs to a remote server.
    1. VMware recommends enabling **mTLS encryption** at the earliest convenience for enhanced security, compliance, and protection against unauthorized access.



Only enable **mTLS encryption** when upgrading from TAS 5 or later. For upgrades from TAS <5 to TAS ≥5, leave this selector unchecked to avoid Log Cache downtime during the upgrade process.

7. (Optional) To include security events in the log stream, select the **Log Cloud Controller security events** check box. When this check box is selected, TAS for VMs logs all API requests in the Common Event Format (CEF), including the endpoint, user, source IP address, and request result.
8. (Optional) To transmit logs over TCP, select the **Use TCP for file forwarding local transport** check box. This prevents log truncation, but might cause performance issues.

- The **Do not forward debug logs** check box is selected by default. To forward **DEBUG** syslog messages to an external service, deselect the check box.



Some TAS for VMs components generate a high volume of **DEBUG** syslog messages. Selecting the **Do not forward debug logs** check box prevents TAS for VMs components from forwarding the **DEBUG** syslog messages to external services. However, TAS for VMs still writes the messages to the local disk.

- For **Custom rsyslog configuration**, enter a custom syslog rule. For more information about adding custom syslog rules, see [Customizing platform log forwarding](#).
- Configure how TAS for VMs emits app logs and app metrics for ingestion in your deployment. The options include:
  - Use existing Firehose integrations for app metric and app log ingestion.
  - Preserve existing Firehose integrations for app metrics, but use an alternate method for app log ingestion.
  - Deactivate all Firehose integrations and use alternate methods for both app log and app metric ingestion.

The following table provides the configuration procedures for each option. For more information about each field, see the [Field Descriptions](#) table.

Option	Configuration Procedure
<b>Use existing Firehose app log and metrics integrations</b>	<ol style="list-style-type: none"> <li>Activate <b>Enable V1 Firehose</b>.</li> <li>Activate <b>Enable V2 Firehose</b>.</li> <li>Deactivate <b>Do not forward app logs to the Firehose</b>.</li> <li>(Optional) Configure <b>Aggregate syslog drain destinations</b>.</li> </ol>
<b>Preserve existing Firehose integrations for app metrics, but use an alternate method for app log ingestion</b>	<p> Do not use this option if your deployment depends on partner log integrations.</p> <ol style="list-style-type: none"> <li>Activate <b>Enable V1 Firehose</b>.</li> <li>Activate <b>Enable V2 Firehose</b>.</li> <li>Activate <b>Do not forward app logs to the Firehose</b>.</li> <li>Configure <b>Aggregate syslog drain destinations</b>.</li> </ol>

Option	Configuration Procedure
<b>Deactivate all Firehose integrations and use alternate methods for both app log and app metric ingestion</b>	 Do not use this option if your deployment depends on any of these: <ul style="list-style-type: none"> <li>◦ Service tile metrics</li> <li>◦ Healthwatch or App Metrics</li> <li>◦ Metric Registrar</li> <li>◦ Partner log or metric integrations</li> </ul>

1. Deactivate **Enable V1 Firehose**.  
 2. Deactivate **Enable V2 Firehose**.  
 3. Deactivate **Do not forward app logs to the Firehose**.  
 4. Configure **Aggregate syslog drain destinations**.  
 5. Scale the **Doppler Server** and **Loggregator Trafficcontroller** instance groups to zero in the **Resource Config** pane. See [Resources](#) for more information.

### Field Descriptions:

The following table provides more details on field values:

Field Name	Description
<b>Enable V1 Firehose</b>	Selected by default. When this check box is selected, logs and metrics flow to the Loggregator V1 Firehose.
<b>Enable V2 Firehose</b>	Selected by default. When this check box is selected, logs and metrics flow to the Loggregator V2 Firehose.
<b>Send default Loggregator drain metadata</b>	Selected by default. When this check box is selected, TAS for VMs sends all metadata in app and aggregate syslog drains. Deselect this check box can reduce logging to external databases by up to 50 percent.
<b>Do not forward app logs to the Firehose</b>	Deselected by default. When this check box is selected, TAS for VMs prevents the Firehose from emitting app logs, but still allows the Firehose to emit app metrics. Deactivating logs in Firehose helps reduce the load on TAS for VMs by allowing you to scale down Doppler and Traffic Controller VMs.

Field Name	Description
<b>Aggregate syslog drain destinations</b>	<p>Specify zero or more aggregate syslog drains. Aggregate syslog drains forward all app logs on your foundation to the endpoints that you provide in this field:</p> <ul style="list-style-type: none"> <li>○ <b>Syslog Drain URL:</b> Enter the endpoint in the format: <code>syslog://HOSTNAME:PORT</code>. To use TLS for sending logs, specify <code>syslog-tls://HOSTNAME:PORT</code>.</li> <li>○ <b>Certificate Authority:</b> (Optional) Enter the Certificate Authority (CA) certificate to trust for the endpoint.</li> <li>○ <b>Client Certificate:</b> (Optional) Enter the client certificate and private key to be used for mTLS communication with the endpoint.</li> </ul> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;">  In earlier versions of TAS for VMs multiple aggregate syslog drains were entered by using a comma-separated list. This is no longer supported and endpoints should be added individually.       </div>

12. (Optional) For **System metrics scrape interval**, the default value is `1m`, which configures TAS for VMs to send BOSH system metrics to your logging endpoint once per minute. To configure TAS for VMs to send metrics more or less frequently, modify the value in this field. For example, enter `2m` to send metrics every two minutes, or `10s` to send metrics every ten seconds. VMware recommends configuring a minimum interval of five seconds, or `5s`.
13. (Optional) For **OpenTelemetry Collector Configuration**, the default value is empty, which deactivates the OpenTelemetry Collector.
  - To configure TAS for VMs to send logs, metrics, and traces using the OpenTelemetry Collector, enter valid OpenTelemetry Collector YAML configuration in this text box. See [Configuring the OpenTelemetry Collector](#) for examples of how to configure OpenTelemetry Collector. Currently TAS for VMs supports a limited number of OpenTelemetry Collector Exporters and Processors.
  - To use non-GA exporters and processors from the available options, you must enable experimental features by selecting the **Experimental OpenTelemetry Collector features** checkbox.

 The OpenTelemetry Collector is supported in TAS for VMs v6.0.13 and later.

 If you configure an exporter that listens on a port, ensure that the port is not claimed by a TAS for VMs component on any of the VMs in your deployment.

14. Click **Save**.

To configure Tanzu Operations Manager for system logging, see [Settings page](#) in [Using the Tanzu Operations Manager interface](#).

## Scale Loggregator Firehose system

Apps constantly generate app logs and TAS for VMs platform components constantly generate component metrics. The Loggregator Firehose system combines these data streams and handles them as follows. For

more information, see [Loggregator Firehose Architecture](#).

- The Loggregator agent running on each component or app VM collects and sends this data out to Doppler components.
- Doppler components temporarily buffer the data before periodically forwarding it to the Traffic Controller. When the log and metrics data input to a Doppler exceeds its buffer size for a given interval, data can be lost.
- The Traffic Controller / Reverse Log Proxy serve the aggregated data stream to clients.

Use the following instructions to scale the Loggregator Firehose system. For guidance on monitoring and capacity planning, see [Monitoring TAS for VMs](#).

## Add component VM instances

To add component VM instances for Loggregator components:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **Resource Config**.
4. Increase the number in the **Instances** column of the component you want to scale. You can add instances for the following Loggregator components:
  - **Loggregator Trafficcontroller**
  - **Doppler Server**
  - **Log Cache**
5. Click **Save**.
6. Return to the Tanzu Operations Manager Installation Dashboard.
7. Click **Review Pending Changes**.
8. Click **Apply Changes**.

## Scale Loggregator Shared Nothing system

VMware recommends the newer Shared Nothing logging and metrics architecture as an alternative to the Loggregator Firehose architecture.

The Shared Nothing architecture egresses logs and metrics from the platform directly from each VM as opposed to the more centralized approach of the Loggregator Firehose architecture. Egressing directly from the VMs where logs and metrics are generated has better scaling characteristics, may reduce costs and should be preferred for new deployments.

For more information, see [Shared Nothing Architecture](#).

- The Syslog agent running on each component or app VM collects and sends this data out to Log Cache and any configured external syslog destination.
- The OpenTelemetry Collector running on each component or app VM egresses metrics via the configured exporters.

When using the Shared Nothing architecture you can potentially scale down the VMs associated with the Loggregator Firehose architecture. See [Scaling down Logging and Metrics infrastructure](#) for more information.

## App traffic logging

App traffic logging generates logs when app containers communicate with each other directly, or attempt to communicate, by container-to-container networking (C2C) policies and App Security Groups (ASGs). For more information about C2C policies, see [Container-to-Container Networking versus ASGs](#) in *Container-to-Container Networking*. For more information about ASGs, see [App Security Groups](#).

With App traffic logging, network security teams audit C2C traffic, by seeing allowed and denied packets, without needing access to the Cloud Controller or the apps themselves.

### Activate app traffic logging

To activate app traffic logging:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select the **Networking** pane.
4. Activate the **Log traffic for all accepted and denied app packets** check box.
5. Click **Save**.
6. Return to the Tanzu Operations Manager Installation Dashboard.
7. Click **Review Pending Changes**.
8. Click **Apply Changes**.

### App logging behavior

App traffic logging generates log messages as follows:

- **TCP traffic:** Logs the first packet of every new TCP connection.
- **UDP traffic:** Logs UDP packets sent and received, up to a maximum per-second rate for each container. Set this rate limit in the **UDP logging interval** field in the **Networking** pane of the TAS for VMs tile. The default rate limit is `100` packets per second.
- **Packets denied:** Logs packets blocked by either a container-specific networking policy or by ASG rules applied across the space, org, or deployment. Logs packet denials up to a maximum per-second rate for each container, set in the **Denied logging interval** field in the **Networking** pane of the TAS for VMs tile. The default rate is `1` (packet per second). For more information about container-specific networking policies, see [Policies](#) in *Container-to-Container Networking*.

### App traffic log format and contents

App traffic logs are formatted as described in the [silk-release Traffic logging](#) documentation, following the `iptables-logger` format but without line breaks.

For example, the first part of an app traffic log line looks like:

```
{"timestamp": "2020-06-23T11:36:01.710452019Z", "source": "cfnetworking.iptables", "message": "cfnetworking.iptables.ingress-allowed", "log_level": 1, "data": {"destination": { "container_id": "d5978989-1401-49ff-46cd-33e5", "app_guid": "bc6f229d-5e4a-4c41-a63f-e8795496c283", ..}}
```

Each log message includes:

- A timestamp, either in RFC3339 format or in epoch format. The format depends upon the configuration of the **Timestamp format for component logs** in the **System Logging** pane of the TAS for VMs tile
- The GUID for the source or destination app that sent or was designated to receive the packet
- The protocol of the communication, [TCP](#) or [UDP](#)
- GUIDs for the container, space, and org running the source or destination app
- IP addresses and ports for both source and destination apps
- A `message` field recording whether the packet was allowed or denied, with one of the following four possibilities:
  - `ASG allowed packet to exit source app container`
  - `C2C policy allowed packet to enter destination app container`
  - `ASG prevented packet from exiting source app container`
  - `C2C policy prevented packet from entering destination app container`
- Additional information described in the [silk-release](#) documentation

### Causes of denied packet

You can determine whether a denied-packet log results from a container networking policy or an ASG rule as follows:

- **Container networking policy:** Log `message` string includes `ingress-denied` and `packet direction is ingress`.
- **ASG rule:** Log `message` string includes `egress-denied` and `packet direction is egress`.

## Global vs. ASG-level app traffic logging

TAS for VMs supports two mechanisms for enabling app traffic logging. Enabling the **Log traffic for all accepted and denied app packets** check box in the **Networking** pane of the TAS for VMs tile activates app traffic logging globally for all ASGs and container policies. Setting the `log` property of an ASG to `true` activates app traffic logging at the individual ASG level. For more information about setting the `log` property of an ASG to `true`, see [The Structure and Attributes of ASGs in App Security Groups](#).

Because these two mechanisms operate independently, TAS for VMs generates duplicate logs when app traffic logging is activated globally and an ASG's `log` property is set to `true`. To avoid duplicate logs, VMware recommends setting the `log` property to `false` for all ASGs, or leaving it out entirely, when app traffic logging is activated globally. For more information, see [App Traffic Logging](#).

To focus on specific ASGs for log analysis, VMware recommends enabling app traffic logs globally and using a logging platform to filter traffic logs by ASG, rather than setting `log` at the individual ASG level.

# App logging in TAS for VMs

Loggregator, the VMware Tanzu Application Service for VMs (TAS for VMs) component responsible for logging, provides a stream of log output from your app and from TAS for VMs system components that interact with your app during updates and execution.

## Overview

By default, Loggregator streams logs to your terminal. To persist more than the limited amount of logging information that Loggregator can buffer, you can drain logs to a third-party log management service. For more information, see [Third-party log management services](#).

TAS for VMs gathers and stores logs in a best-effort manner. If a client cannot consume log entries quickly enough, the Loggregator buffer might need to overwrite some lines before the client has consumed them. A syslog drain or a command-line interface (CLI) tail can usually keep up with the flow of app logs.

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## Contents of a log entry

Every log entry contains four fields:

- Timestamp
- Log type, or origin code
- Channel: either `OUT`, for logs emitted on `stdout`, or `ERR`, for logs emitted on `stderr`
- Message

Loggregator assigns the timestamp when it receives log data. The log data is opaque to Loggregator, which only puts it in the message field of the log entry. Apps or system components sending log data to Loggregator might include their own timestamps, which then appear in the message field.

Many TAS for VMs components include the option to use human-readable timestamps in log messages. To configure TAS for VMs to use human-readable timestamps when possible, see [Configure System Logging](#) in *Configuring TAS for VMs*. For more information about human-readable timestamps, see [RFC 3339](#).

Origin codes distinguish the different log types. Origin codes from system components have three letters. The app origin code is `APP`, followed by slash and a digit that indicates the app instance.

Many frameworks write to an app log that is separate from `stdout` and `stderr`. This is not supported by Loggregator. Your app must write to `stdout` or `stderr` for its logs to be in the Loggregator stream. Ensure that the buildpack your app uses writes logs to `stdout` and `stderr` only. Some buildpacks do this, and some do not.

## Log types and their messages

Different types of logs have different message formats, as shown in the following examples. The digit appended to the code indicates the instance index: 0 is the first instance, 1 is the second, and so on.

## API

Users make API calls to request changes in app state. The Cloud Controller, the TAS for VMs component responsible for the API, logs the actions that the Cloud Controller takes in response.

For example:

```
2016-06-14T14:10:05.36-0700 [API/0]      OUT Updated app with guid cdabc600-0  
b73-48e1-b7d2-26af2c63f933 {"name":>"spring-music", "instances":>1, "memor  
y":>512, "environment_json":>"PRIVATE DATA HIDDEN")
```

## STG

The Diego Cell or the Droplet Execution Agent emits **STG** logs when staging or restaging an app. These actions implement the state requested by the user. After the droplet is uploaded, **STG** messages end and **CELL** messages begin. For **STG**, the instance index is almost always **0**.

For example:

```
2016-06-14T14:10:27.91-0700 [STG/0]      OUT Staging...
```

## RTR

The Gorouter emits **RTR** logs when it routes HTTP requests to the app. Gorouter messages include the app name followed by a Gorouter timestamp and selections from the HTTP request.

For example:

```
2016-06-14T10:51:32.51-0700 [RTR/1]      OUT www.example.com - [14/06/2016:1  
7:51:32.459 +0000] "GET /user/ HTTP/1.1" 200 0 103455 "-" "Mozilla/5.0 (Windo  
ws NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/36.0.1985.123  
Safari/537.30" 192.0.2.132:46359 x_forwarded_for:"198.51.100.120" x_forwarded  
_proto:"http" vcap_request_id:9365d216-623a-45cb-6ef6-eba495c19fa8 response_t  
ime:0.059468637 app_id:79cc58aa-3737-43ae-ac71-39a2843b5178
```

### Zipkin trace logging

If Zipkin trace logging is allowed in TAS for VMs, Gorouter access log entries contain Zipkin HTTP headers.

Here is an example access log entry containing Zipkin headers:

```
2016-11-23T16:04:01.49-0800 [RTR/0]      OUT www.example.com - [24/11/2016:0  
0:04:01.227 +0000] "GET / HTTP/1.1" 200 0 109 "-" "curl/7.43.0" 10.0.2.150:40  
70 10.0.48.66:60815 x_forwarded_for:"198.51.100.120" x_forwarded_proto:"http"  
vcap_request_id:87f9d899-c7a4-46cd-7b76-4ec35ce9921b response_time:0.26300096  
6 app_id:8e5d6451-b369-4423-bce8-3a7a9e479dbb app_index:0 x_b3_traceid:"2d561  
0bf5e0f7241" x_b3_spanid:"2d5610bf5e0f7241" x_b3_parentspanid:""-"
```

For more information about Zipkin tracing, see [Zipkin tracking in HTTP headers in HTTP Routing](#).

## LGR

Loggregator emits `LGR` logs to indicate problems with logging. Examples include `can't reach syslog drain url` and `dropped log messages due to high rate`.

## APP

Every app emits `APP` logs to Loggregator.

For example:

```
2016-06-14T14:10:15.18-0700 [APP/0]      OUT Exit status 0
```

The logs allow you to determine the particular revision and process of the application instance logging.

For example, below shows the log line from two different revisions and web instances.

```
2022-09-15T01:59:33.99+0000 [APP/PROC/REV/2/WEB/0] OUT hello world from new
2022-09-15T01:59:34.99+0000 [APP/PROC/REV/1/WEB/1] OUT hello world from old
```



Logs with revision id are only available if the application uses revisions and it is enabled in the platform

Each app might have a configured log rate limit. If the app logs exceed the configured log rate limit, you see a log entry indicating that the limit was exceeded.

For example:

```
2022-09-15T01:59:33.99+0000 [APP/PROC/WEB/0] OUT app instance exceeded log rate limit (16384 bytes/sec)
```

## SSH

The Diego Cell emits `SSH` logs when a user accesses an application container through SSH by using the Cloud Foundry Command Line Interface (cf CLI) `cf ssh` command.

For example:

```
2016-06-14T14:16:11.49-0700 [SSH/0]      OUT Successful remote access by 192.0.2.33:7856
```

For more information about the `cf ssh` command, enter `cf ssh --help`.

## CELL

The Diego Cell emits `CELL` logs when it starts or stops the app. These actions implement the state requested by the user. The Diego Cell also emits messages when an app fails.

For example:

```
2016-06-14T13:44:38.14-0700 [CELL/0]      OUT Successfully created container
```

## Writing to the log from your app

Your app must write logs to `stderr` or `stdout`. Both are typically buffered, and you can flush the buffer before delivering the message to Loggregator.

Alternatively, you can write log entries to `stderr` or `stdout` synchronously. This approach is mainly used for debugging because it might affect app performance.

## Viewing Logs

To view logs, run the `cf logs` command. You can tail, dump, or filter log output. For more information about the `cf logs` command, enter `cf logs --help`.

### Tailing logs

To stream Loggregator output to the terminal:

1. Run:

```
cf logs APP-NAME
```

Where `APP-NAME` is the name of your app. The command returns output similar to this example:

```
Connected, tailing logs for app spring-music in org example / space development as admin@example.com...

2016-06-14T15:16:12.70-0700 [RTR/4]      OUT www.example.com - [14/06/2016:22:16:12.582 +0000] "GET / HTTP/1.1" 200 0 103455 "-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 192.0.2.206:27743 x_forwarded_for:"203.0.113.222" x_forwarded_proto:"http" vcap_request_id:bd3e6ed1-5dd0-43ab-70ed-5d232b577b09 response_time:0.12050583 app_id:79bb58ab-3737-43be-ac70-39a2843b5177
2016-06-14T15:16:20.06-0700 [RTR/4]      OUT www.example.com - [14/06/2016:22:16:20.034 +0000] "GET /test/ HTTP/1.1" 200 0 6879 "http://www.example.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 192.0.2.206:2228 x_forwarded_for:"203.0.113.222" x_forwarded_proto:"http" vcap_request_id:a31f0b1d-3827-4b8f-57e3-6f42d189f025 response_time:0.033311281 app_id:79bb58aa-3747-43be-ac70-39a3843b5178
2016-06-14T15:16:22.44-0700 [RTR/4]      OUT www.example.com - [14/06/2016:22:17:22.415 +0000] "GET /test5/ HTTP/1.1" 200 0 5461 "http://www.example.com/test5" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 192.0.2.206:2228 x_forwarded_for:"203.0.113.322" x_forwarded_proto:"http" vcap_request_id:5d6855a2-4a79-4432-7927-de8215f5a2c7 response_time:0.029211609 app_id:79bb58aa-3737-43bb-ac70-39a2943b5178
...

```

Press **Ctrl+C** or **Command+C** on your keyboard to exit the real-time stream.

### Dump logs

To display all of the lines in the Loggregator buffer:

- Run:

```
cf logs APP-NAME --recent
```

Where `APP-NAME` is the name of your app.

## Filter logs

To view some subset of log output, run `cf logs APP-NAME` in conjunction with filtering commands of your choice, where `APP-NAME` is the name of your app. In the following example, run `cf logs spring-music --recent | grep -v RTR` to exclude all Gorouter logs:

```
$ cf logs spring-music
Connected, tailing logs for app spring-music in org example / space development as admin@example.com...

2016-06-14T15:16:12.70-0700 [RTR/4]      OUT www.example.com - [14/06/2016:2
2:16:12.582 +0000] "GET / HTTP/1.1" 200 0 103455 "-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 192.0.2.206:27743 x_forwarded_for:"203.0.113.222" x_forwarded_proto:"http" vcap_request_id:bd3e6ed1-5dd0-43ab-70ed-5d232b577b09 response_time:0.12050583 app_id:79bb58ab-3737-43be-ac70-39a2843b5177
2016-06-14T15:16:20.06-0700 [RTR/4]      OUT www.example.com - [14/06/2016:2
2:16:20.034 +0000] "GET /test/ HTTP/1.1" 200 0 6879 "http://www.example.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 192.0.2.206:2228 x_forwarded_for:"203.0.113.222" x_forwarded_proto:"http" vcap_request_id:a31f0b1d-3827-4b8f-57e3-6f42d189f025 response_time:0.033311281 app_id:79bb58aa-3747-43be-ac70-39a3843b5178
2016-06-14T15:16:22.44-0700 [RTR/4]      OUT www.example.com - [14/06/2016:2
2:17:22.415 +0000] "GET /test5/ HTTP/1.1" 200 0 5461 "http://www.example.com/test5" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/50.0.2661.102 Safari/537.36" 192.0.2.206:2228 x_forwarded_for:"203.0.113.322" x_forwarded_proto:"http" vcap_request_id:5d6855a2-4a79-4432-7927-de8215f5a2c7 response_time:0.029211609 app_id:79bb58aa-3737-43bb-ac70-39a2943b5178
...

```

Use **Ctrl-C** (^C) to exit the real-time stream.

## Dumping logs

To display all of the lines in the Loggregator buffer, run `cf logs APP-NAME --recent`, where `APP-NAME` is the name of your app.

## Filtering logs

To view some subset of log output, run `cf logs APP-NAME` in conjunction with filtering commands of your choice. Replace `APP-NAME` with the name of your app. In the following example, `grep -v RTR` excludes all Gorouter logs:

```
$ cf logs spring-music --recent | grep -v RTR
2016-06-14T14:10:05.36-0700 [API/0]      OUT Updated app with guid cdabc604-0
b73-47e1-a7d5-24af2c63f723 ({"name"=>"spring-music", "instances"=>1, "memor
y"=>512, "environment_json"=>"PRIVATE DATA HIDDEN"})
2016-06-14T14:10:14.52-0700 [APP/0]      OUT - Gracefully stopping, waiting f
or requests to finish
2016-06-14T14:10:14.52-0700 [CELL/0]     OUT Exit status 0
2016-06-14T14:10:14.54-0700 [APP/0]     OUT === puma shutdown: 2016-06-14 2
1:10:14 +0000 ===
2016-06-14T14:10:14.54-0700 [APP/0]     OUT - Goodbye!
2016-06-14T14:10:14.56-0700 [CELL/0]   OUT Creating container
...
...
```

## Log ordering

Both operators and developers must ensure log ordering in drains.

- Diego uses a nanosecond-based timestamp that can be ingested properly by Splunk. For more information, see the [Splunk documentation](#).
- The Elastic Stack can ingest the nanosecond timestamps but only supports millisecond precision, so timestamps are truncated. For more information, see the [Elasticsearch documentation](#) and [Date type has not enough precision for the logging use case](#) on GitHub.

If you are developing a client that displays a stream of TAS for VMs logs to users, you can order the logs to improve the debugging experience for your user. Here are some general tips for ordering logs:

- For CLIs, batch the logs and display the logs you have in that timeframe, sorted by timestamp.
- For web clients, use dynamic HTML to insert older logs into the sorting as they appear. This creates complete, ordered logs.
- Java app developers might want to convert stack traces into a single log entity. To simplify log ordering for Java apps, use the multi-line Java message workaround to convert your multi-line stack traces into a single log entity. For more information, see [Multi-line Java message workaround](#).

By changing the Java log output, you can force your app to reformat stack trace messages, replacing newline characters with a token. Set your log parsing code to replace that token with newline characters again to display the logs properly in Kibana.

## Security event logging

Here you can learn how to activate and interpret security event logging for the Cloud Controller, the User Account and Authentication (UAA) server, and CredHub. You can use these logs to retrieve information about a subset of requests to the Cloud Controller, UAA server, and CredHub for security or compliance purposes.

### Cloud Controller logging

The Cloud Controller logs security events to syslog. You must configure a syslog drain to forward your system logs to a log management service.

For more information, see [Configuring System Logging in TAS for VMs](#).

## Formatting log entries

Cloud Controller logs security events in the [Common Event Format](#) (CEF). CEF specifies the following format for log entries:

```
CEF:Version|Device Vendor|Device Product|Device Version|Signature ID|Name|Severity|Extension
```

Entries in the Cloud Controller log use the following format:

```
CEF:CEF_VERSION|cloud_foundry|cloud_controller_ng|CC_API_VERSION|
SIGNATURE_ID|NAME|SEVERITY|rt=TIMESTAMP suser=USERNAME uid=USER_GUID
cs1Label=userAuthenticationMechanism cs1=AUTH_MECHANISM
cs2Label=vcapRequestId cs2=VCAP_REQUEST_ID request=REQUEST
requestMethod=REQUEST_METHOD cs3Label=result cs3=RESULT
cs4Label=httpStatusCode cs4=HTTP_STATUS_CODE src=SOURCE_ADDRESS
dst=DESTINATION_ADDRESS cs5Label=xForwardedFor cs5=X_FORWARDED_FOR_HEADER
```

See the following list for a description of the properties shown in the Cloud Controller log format:

- **CEF\_VERSION**: The version of CEF used in the logs.
- **CC\_API\_VERSION**: The current Cloud Controller API version.
- **SIGNATURE\_ID**: The method and path of the request. For example, `GET /v2/app:GUID`.
- **NAME**: The same as `SIGNATURE_ID`.
- **SEVERITY**: An integer that reflects the importance of the event.
- **TIMESTAMP**: The number of milliseconds since the Unix epoch.
- **USERNAME**: The name of the user who originated the request.
- **USER\_GUID**: The GUID of the user who originated the request.
- **AUTH\_MECHANISM**: The user authentication mechanism. This can be `oauth-access-token`, `basic-auth`, or `no-auth`.
- **VCAP\_REQUEST\_ID**: The VCAP request ID of the request.
- **REQUEST**: The request path and parameters. For example, `/v2/info?MY-PARAM=VALUE`.
- **REQUEST\_METHOD**: The method of the request. For example, `GET`.
- **RESULT**: The meaning of the HTTP status code of the response. For example, `success`.
- **HTTP\_STATUS\_CODE**: The HTTP status code of the response. For example, `200`.
- **SOURCE\_ADDRESS**: The IP address of the client who originated the request.
- **DESTINATION\_ADDRESS**: The IP address of the Cloud Controller VM.
- **X\_FORWARDED\_FOR\_HEADER**: The contents of the X-Forwarded-For header of the request. This is empty if the header is not present.

## Examples of log entries

The following list provides several example requests with the corresponding Cloud Controller log entries.

- An anonymous `GET` request:

```
CEF:0|cloud_foundry|cloud_controller_ng|2.54.0|GET /v2/info|GET
/v2/info|0|rt=1460690037402 suser= uid= request=/v2/info
requestMethod=GET src=127.0.0.1 dst=192.0.2.1
cs1Label=userAuthenticationMechanism cs1=no-auth cs2Label=vcapRequestId
cs2=c4bac383-7cc9-4d9f-b1c0-1iq8c0baaa000 cs3Label=result cs3=success
cs4Label=httpStatusCode cs4=200 cs5Label=xForwardedFor
cs5=198.51.100.1
```

- A `GET` request with basic authentication:

```
CEF:0|cloud_foundry|cloud_controller_ng|2.54.0|GET /v2/syslog_drain_urls|GET
/v2/syslog_drain_urls|0|rt=1460690165743 suser=bulk_api uid=
request=/v2/syslog_drain_urls?batch_size\=1000 requestMethod=GET
src=127.0.0.1 dst=192.0.2.1 cs1Label=userAuthenticationMechanism
cs1=basic-auth cs2Label=vcapRequestId cs2=79187189-e810-33dd-6911-b5d015bbc999
::eat1234d-4004-4622-ad11-9iaai88e3ae9 cs3Label=result cs3=success
cs4Label=httpStatusCode cs4=200 cs5Label=xForwardedFor cs5=198.51.100.1
```

- A `GET` request with OAuth access token authentication:

```
CEF:0|cloud_foundry|cloud_controller_ng|2.54.0|GET /v2/routes|GET
/v2/routes|0|rt=1460689904925 suser=admin uid=c7ca208f-8a9e-4aab-
92f5-28795f86d62a request=/v2/routes?inline-relations-depth\=1&q\=
host%3Adora%3Bdomain_guid%3B777-1o9f-5f5n-i888-o2025cb2dfc3
requestMethod=GET src=127.0.0.1 dst=192.0.2.1
cs1Label=userAuthenticationMechanism cs1=oauth-access-token
cs2Label=vcapRequestId cs2=79187189-990i-8930-52b2-9090b2c5poz0
::5a265621-b223-4520-afae-ab7d0ee7c75b cs3Label=result cs3=success
cs4Label=httpStatusCode cs4=200 cs5Label=xForwardedFor cs5=198.51.100.1
```

- A `GET` request that results in a 404 error:

```
CEF:0|cloud_foundry|cloud_controller_ng|2.54.0|GET /v2/apps/7f310103-
39aa-4a8c-b92a-9ff8a6a2fa6b|GET /v2/apps/7f310103-39aa-4a8c-b92a-
9ff8a6a2fa6b|0|rt=1460691002394 suser=bob uid=a00i2026-55io-3983-
555o-40e611410aec request=/v2/apps/7f310103-39aa-4a8c-b92a-9ff8a6a2fa6b
requestMethod=GET src=127.0.0.1 dst=192.0.2.1
cs1Label=userAuthenticationMechanism cs1=oauth-access-token cs2Label=vcapRequest
tId
cs2=49f21579-9eb5-4bdf-6e49-e77d2de647a2::9f8841e6-e04a-498b-b3ff-d59cf7cb7ea
cs3Label=result cs3=clientError cs4Label=httpStatusCode cs4=404
cs5Label=xForwardedFor cs5=198.51.100.1
```

- A `POST` request that results in a 403 error:

```
CEF:0|cloud_foundry|cloud_controller_ng|2.54.0|POST /v2/apps|POST
/v2/apps|0|rt=1460691405564 suser=bob uid=4f9a33f9-fb13-4774-a708-
f60c939625cd request=/v2/apps?async\=true requestMethod=POST
src=127.0.0.1 dst=192.0.2.1 cs1Label=userAuthenticationMechanism
cs1=oauth-access-token cs2Label=vcapRequestId cs2=booc03111-9999-4003-88ab-
```

```
20i9r33333ou::5a4993fc-722f-48bc-aff4-99b2005i9bb5 cs3Label=result
cs3=clientError cs4Label=httpStatusCode cs4=403 cs5Label=xForwardedFor
cs5=198.51.100.1
```

## UAA logging

UAA logs security events to a file located at `/var/vcap/sys/log/uaa/uaa.log` on the UAA virtual machine (VM). Because these logs are rotated, you must configure a syslog drain to forward your system logs to a log management service.

For more information, see [Configuring System Logging in TAS for VMs](#).

## Log Events

UAA logs identify the following categories of events:

- Authorization and Password Events
- SCIM Administration Events
- Token Events
- Client Administration Events
- UAA Administration Events

To learn more about the names of the events included in these categories and the information they record in the UAA logs, see [User Account and Authentication Service Audit Requirements](#).

## Examples of log entries

The following sections provide several example requests with the corresponding UAA log entries.

### Successful user authentication

```
Audit: TokenIssuedEvent ('["openid","scim.read","uaa.user",
"cloud_controller.read","password.write","cloud_controller.write",
"scim.write"]'): principal=a42026d6-5533-1884-eef2-838abcd0i3e3,
origin=[client=cf, user=bob], identityZoneId=[uaa]
```

- This entry records a `TokenIssuedEvent`.
- UAA issued a token associated with the scopes `"openid","scim.read","uaa.user",
"cloud_controller.read","password.write","cloud_controller.write","scim.write"` to the user `bob`.

### Failed user authentication

```
Audit: UserAuthenticationFailure ('bob@example.com'):
principal=61965469-c821-46b7-825f-630e12a51d6c,
origin=[remoteAddress=198.51.100.1, clientId=cf],
identityZoneId=[uaa]
```

- This entry records a `UserAuthenticationFailure`.

- The user `bob@example.com` originating at `198.51.100.1` failed to authenticate.

### Successful user creation

```
Audit: UserCreatedEvent ('["user_id=61965469-c821-46b7-825f-630e12a51d6c","username=bob@example.com"]'): principal=91220262-d901-44c0-825f-633i33b55d6c, origin=[client=cf, user=admin, details=(198.51.100.1, tokenType=bearertokenValue=<TOKEN>, sub=20i03423-dd8e-33e1-938d-e9999e30f500, iss=https://uaa.example.com/oauth/token)], identityZoneId=[uaa]
```

- This entry records a `UserCreatedEvent`.
- The `admin` user originating at `198.51.100.1` created a user named `bob@example.com`.

### Successful user deletion

```
Audit: UserDeletedEvent ('["user_id=61965469-c821-46b7-825f-630e12a51d6c","username=bob@example.com"]'): principal=61965469-c821-46b7-825f-630e12a51d6c, origin=[client=admin, details=(remoteAddress=198.51.100.1, tokenType=bearertokenValue=<TOKEN>, sub=admin, iss=https://uaa.example.com/oauth/token)], identityZoneId=[uaa]
```

- This entry records a `UserDeletedEvent`.
- The `admin` user originating at `198.51.100.1` deleted a user named `bob@example.com`.

## CredHub logging

CredHub logs security events to a file located at

`/var/vcap/sys/log/credhub/credhub_security_events.log` on the CredHub VM. Because these logs are rotated, you must configure a syslog drain to forward your system logs to a log management service.

For more information, see [Configuring System Logging in TAS for VMs](#).

## Format for Log Entries

CredHub logs security events in the [Common Event Format](#) (CEF). CEF specifies the following format for log entries:

```
CEF:Version|Device Vendor|Device Product|Device Version|Signature ID|Name|Severity|Extension
```

Entries in the CredHub log use the following format:

```
CEF:0|cloud_foundry|credhub|CREDHUB_SERVER_VERSION|
SIGNATURE_ID|NAME|0|rt=TIMESTAMP suser=USERNAME uid=USER_GUID
cs1Label=userAuthenticationMechanism cs1=AUTH_MECHANISM
request=REQUEST requestMethod=REQUEST_METHOD
cs3Label=versionUuid cs3=VERSION_UUID
cs4Label=httpStatusCode cs4=HTTP_STATUS_CODE src=SOURCE_ADDRESS dst=DESTINATION_ADDRESS
```

```
cs2Label=resourceName cs2=RESOURCE_NAME
cs5Label=resourceUuid cs5=RESOURCE_UUID deviceAction=OPERATION
cs6Label=requestDetails cs6=REQUEST_DETAILS
```

See the following list for a description of the properties shown in the CredHub log.

- **CEF\_VERSION**: The version of CEF used in the logs.
- **CREDHUB\_SERVER\_VERSION**: The current CredHub server version.
- **SIGNATURE\_ID**: The method and path of the request. For example, `GET /v2/app:GUID`.
- **NAME**: The same as **SIGNATURE\_ID**.
- **TIMESTAMP**: The number of milliseconds since the Unix epoch.
- **USERNAME**: The name of the user who originated the request, as defined by UAA. In the case of mTLS, no-auth, or not defined, this value is empty.
- **USER\_GUID**: The “actor” identifier. For example, `mtls-app:GUID`. If there is no authenticated user, this value is empty.
- **AUTH\_MECHANISM (cs1)**: The user authentication mechanism. This can be `oauth-access-token`, `mtls-auth`, or `no-auth`.
- **REQUEST**: The request path and parameters. For example, `/v2/info?MY-PARAM=VALUE`.
- **REQUEST\_METHOD**: The method of the request. For example, `GET`.
- **HTTP\_STATUS\_CODE (cs4)**: The HTTP status code of the response. For example, `200`.
- **SOURCE\_ADDRESS**: The IP address of the client who originated the request.
- **DESTINATION\_ADDRESS**: The IP address of the CredHub VM.
- **RESOURCE\_NAME (cs2)**: The credential path name. For example, `/my/awesome/credential`.
- **RESOURCE\_UUID (cs5)**: The top-level credential UUID. This is not the credential version.
- **VERSION\_UUID (cs3)**: The credential version UUID.
- **OPERATION (deviceAction)**: The device action. The possible operations include the following:
  - `get`
  - `set`
  - `generate`
  - `regenerate`
  - `bulk-regenerate`
  - `delete`
  - `find`
  - `get-permissions`
  - `add-permission`
  - `delete-permission`
  - `interpolate`

- info
- version
- health
- key-usage
- update-transitional-version
- REQUEST\_DETAILS (cs6): A JSON blob that differs per request.

The CredHub logs include descriptions for each custom label. For example, the logs include cs2Label=resourceName to define the cs2 label. The value for resourceName appears in the log next to cs2=/path/to/credential.

## Example Log Entries

The following sections provide several example requests with the corresponding CredHub log entries.

### Accessing a credential

```
CEF:0|cloud_foundry|credhub|2.0.0-beta.28|GET /api/v1/data|
GET /api/v1/data|0|rt=1530901816757
suser=app:3c538393-d192-4e23-8c83-456654b3fa6c
suid=mtls-app:3c538393-d192-4e23-8c83-456654b3fa6c
cs1Label=userAuthenticationMechanism
cs1=mutual_tls request=/api/v1/data?path=0b353167-0d5a-48c7-5036-7eaa
requestMethod=GET
cs3Label=versionUuid cs3=null
cs4Label=httpStatusCode cs4=200 src=10.0.0.1 dst=credhub.service.cf.internal
cs2Label=resourceName cs2=null
cs5Label=resourceUuid cs5=null deviceAction=FIND
cs6Label=requestDetails
cs6={"nameLike":null,"path":"0b353167-0d5a-48c7-5036-7eaa","paths":null}
```

- A user authenticated to the CredHub instance using mutual\_tls from 10.0.0.1.
- The authenticated user accessed a CredHub credential.

### Setting a credential

```
CEF:0|cloud_foundry|credhub|2.0.0-beta.28|PUT /api/v1/data|
PUT /api/v1/data|0|rt=1530901097921
suser=cc_service_key_client suid=uaa-client:cc_service_key_client
cs1Label=userAuthenticationMechanism
cs1=uaa request=/api/v1/data requestMethod=PUT
cs3Label=versionUuid cs3=32b3d5bf-463a-4045-a6b5-65c97e61059a
cs4Label=httpStatusCode cs4=200 src=10.0.0.1 dst=credhub.service.cf.internal
cs2Label=resourceName cs2=/1530901097842989110
cs5Label=resourceUuid cs5=ccda25c5-a40a-4512-b6f5-a42f8c3b5c4c deviceAction=SET
cs6Label=requestDetails
cs6={"name":"/1530901097842989110","type":"json","mode":null,
"additionalPermissions":[{"actor": "uaa-client:cc_service_key_client",
"allowedOperations": ["READ", "WRITE", "DELETE", "WRITE_ACL", "READ_ACL"]}]}
```

- A user authenticated to the CredHub instance with UAA from [10.0.0.1](#).
- The authenticated user set a CredHub credential.

### Generating a credential

```
CEF:0|cloud_foundry|credhub|2.0.0-beta.28|POST /api/v1/data|
POST /api/v1/data|0|rt=1530901403532
suser=app:3c538393-d192-4e23-8c83-456654b3fa6c
suid=mtls-app:3c538393-d192-4e23-8c83-456654b3fa6c
cs1Label=userAuthenticationMechanism
cs1=mutual_tls request=/api/v1/data requestMethod=POST
cs3Label=versionUuid cs3=8c21b7b3-d4bf-4d8a-a0c5-64c8c207cb40
cs4Label=httpStatusCode cs4=200 src=10.0.0.1 dst=credhub.service.cf.internal
cs2Label=resourceName cs2=/0b353167-0d5a-48c7-5036-7eaa/2
cs5Label=resourceUuid cs5=1d55cff3-5264-434c-a127-0810f341cb2b deviceAction=GENERATE
cs6Label=requestDetails cs6={"name":"/my/awesome/credential","type":"password",
"mode":null,"additionalPermissions": [{"actor": "mtls-app:3c538393-d192-4e23-8c83-456654b3fa6c",
"allowedOperations": ["READ", "WRITE", "DELETE", "WRITE_ACL", "READ_ACL"] }]} }
```

- A user authenticated to the CredHub instance using [mutual\\_tls](#) from [10.0.0.1](#).
- The authenticated user generated a password credential named [/my/awesome/credential](#).

## Limiting your App Log Rate in Cloud Foundry

Here you can learn about limiting your app log rate for apps in VMware Tanzu Application Service for VMs.

Log rate limiting limits the number of logs that can be sent to an app.

App log rate limiting is deactivated by default. VMware recommends activating this feature to prevent app instances from overloading the Loggregator Agent with logs, so the Loggregator Agent does not drop logs for other app instances on the same Diego Cell.

Using app log rate limiting can also do the following:

- Prevent apps from reporting inaccurate app metrics in the Cloud Foundry Command Line Interface (cf CLI), which can happen if Log Cache evicts metrics from its cache in order to store large volumes of logs.
- Limit the CPU usage of logging agents on the Diego Cell VM.

You can define log rate limits on a per-app basis in bytes per second.

## App log rate limiting in bytes per second

In TAS for VMs, you can limit the number of bytes each app instance can generate per second.

You can configure app log rate limiting in bytes per second on a per-app and per-task basis through the cf CLI. Log rate limits can also be defined for apps in the application manifest. Additionally, you can enforce the log rate limit you configure for all apps that are deployed within a space or org by specifying the log rate limit in the quota plan for the space or org. For more information, see [Creating and Modifying Quota Plans](#).

## Determining the ideal app log rate limit

The ideal app logging rate for a deployment depends on characteristics such as VM sizes and the number and type of apps in TAS for VMs. VMware recommends using at minimum the default limit of [1k](#) bytes per second.

When you allow app log rate limiting, Diego applies the log rate limit to each app instance. For example, if there are five instances of an app running, Diego does not sum the logging rates of all five instances when determining if the log rate limit has been exceeded. Instead, Diego evaluates the logging rate of each individual app instance and only limits instances that exceed the log rate limit.

## What happens when app instances exceed the app log rate limit

When an app instance exceeds the log rate limit you configured, Diego drops the app logs that exceed that limit. When this happens, you see a message indicating that Diego is dropping app logs.

For more information about how Diego rate-limits app logs, see the [Go documentation](#).

## How Diego Cells behave when an app instance exceeds the app log rate

When an app instance exceeds the log rate limit, the Diego Cell containing the app instance emits the `AppInstanceExceededLogRateLimitCount` counter metric, similar to the following example:

```
origin:"rep" eventType:CounterEvent timestamp:1582582740243576212 deployment:"cf" job:"diego-cell" index:"0e98fd00-47b2-4589-94f0-385f78b3a04d" ip:"10.0.1.12" tags:<key:"instance_id" value:"0e98fd00-47b2-4589-94f0-385f78b3a04d"> tags:<key:"source_id" value:"rep" > counterEvent:<name:"AppInstanceExceededLogRateLimitCount" delta:1 total:206 >
```

Each Diego Cell in a deployment has a unique `AppInstanceExceededLogRateLimitCount` counter. The `total` value of the counter is the sum total of all app instances on that Diego Cell that have exceeded the log rate limit since the creation of the Diego Cell. When there are no app instances exceeding the log rate limit, Diego Cells do not emit the `AppInstanceExceededLogRateLimitCount` metric.

For example, `app-instanceA` and `app-instanceB` are running on one Diego Cell, `app-instanceC` and `app-instanceD` are running on a second Diego Cell, and the current `total` for the `AppInstanceExceededLogRateLimitCount` is `125` on the first Diego Cell and `43` on the second Diego Cell. If `app-instanceD` exceeds the log rate limit, the second Diego Cell emits the `AppInstanceExceededLogRateLimitCount` metric with a incremented `total` value of `44`. However, the first Diego Cell does not emit the `AppInstanceExceededLogRateLimitCount` metric, and the `total` value for the `AppInstanceExceededLogRateLimitCount` metric on the first Diego Cell is still `125`.

A Diego Cell emits the `AppInstanceExceededLogRateLimitCount` metric conditionally when an app instance on that Diego Cell begins to exceed the log rate limit. For example, `app-instanceC` and `app-instanceD` are on the same Diego Cell. If `app-instanceC` exceeds the log rate limit continually over a ten-minute period, and `app-instanceD` exceeds the log rate limit during the first three minutes of each five-minute interval within that ten-minute period and then stops, the Diego Cell emits the `AppInstanceExceededLogRateLimitCount` metric three times within that ten-minute period.

## Configuring an alert for the AppInstanceExceededLogRateLimitCount metric

If you are using a third-party log management service, you can configure an alert for when the aggregated sum of the `AppInstanceExceededLogRateLimitCount` metric across all the Diego Cells in TAS for VMs has been incremented more than a certain number of times or over a certain percentage in the last five or more minutes.

When you configure this alert, consider the number of app instances running on TAS for VMs, the logging rate that you configured in TAS for VMs, your other TAS for VMs configuration settings, and so on.

For more information about third-party log management services, see [Streaming App Logs to Log Management Services](#).

## Identifying apps that exceed the app log rate limit

Diego also logs when a noisy app instance exceeds the log rate limit configured in TAS for VMs. A log message similar to the following example: appears in the log stream for the noisy app:

```
2022-08-22T12:42:18.90-0800 [APP/PROC/WEB/0] OUT app instance exceeded log rate limit (1024 bytes/sec)
```

To identify which app instances are exceeding the app log rate limit, you can search through application logs for the string “app instance exceeded log rate limit”.

One way to do this across all applications is by using the Firehose cf CLI plug-in.

1. In a terminal window, install the Firehose plug-in by running:

```
cf install-plugin 'Firehose Plugin'
```

2. Filter your app log messages by running:

```
cf nozzle -f LogMessage | grep "app instance exceeded log rate limit"
```

This command returns all logs with log messages containing “`app instance exceeded log rate limit`”, similar to the following example:

```
origin:"rep" eventType:LogMessage timestamp:1583859621886751670 deployment:"warp-drive" job:"diego-cell" index:"3a574bde-91df-48b8-ae21-1d6913da0908" ip:"10.0.1.33" tags:<key:"app_id" value:"34bcfafc-402b-4bb4-84db-aea5401b79eb" > tags:<key:"app_name" value:"app-2" > tags:<key:"instance_id" value:"0" > tags:<key:"organization_id" value:"a30f39c2-4ff3-48a1-a869-a9ed21812a61" > tags:<key:"organization_name" value:"test" > tags:<key:"process_id" value:"34bcfafc-402b-4bb4-84db-aea5401b79eb" > tags:<key:"process_instance_id" value:"92e2ee78-3a1d-41a6-4933-e47b" > tags:<key:"process_type" value:"web" > tags:<key:"source_id" value:"34bcfafc-402b-4bb4-84db-aea5401b79eb" > tags:<key:"space_id" value:"0e2d2d58-3ef5-43f3-b880-c8a30903a96b" > tags:<key:"space_name" value:"test-2" > logMessage:<message:"app instance exceeded log rate limit (1024 bytes/sec)" message_type:OUT timestamp:1583859621886751670 app_id:"34bcfafc-402b-4bb4-84db-aea5401b79eb" >
```

```
2b-4bb4-84db-aea5401b79eb" source_type:"APP/PROC/WEB" source_instance:"0" >
```

You can inspect these logs to identify which app instances are exceeding the log rate limit.

## Customizing platform log forwarding

You can configure VMware Tanzu Application Service for VMs (TAS for VMs) to forward logs to remote endpoints using the syslog protocol defined in [RFC 5424](#). For more information about enabling log forwarding, see [System logging](#) in *Configuring TAS for VMs*.

TAS for VMs annotates forwarded messages with structured data. This structured data identifies the originating BOSH Director, deployment, instance group, availability zone, and instance ID. All logs forwarded from BOSH jobs have their PRI set to [14](#), representing **Facility: user-level messages** and **Informational: informational messages**, as defined in [RFC 5424 Section 6.2.1](#). This PRI value might not reflect the originally intended PRI of the log.

Logs forwarded from other sources, such as kernel logs, retain their original PRI value.

The following table describes the log line Structured Data:

Structured Data	Description
ENTERPRISE_NUMBER	TAS for VMs's private enterprise number, <a href="#">47450</a> , as defined in <a href="#">RFC 5424 Section 7.2.2</a>
DIRECTOR	The name of the BOSH Director managing the deployment.
DEPLOYMENT	The name of the BOSH deployment.
INSTANCE_GROUP	The name of the BOSH instance group.
AVAILABILITY_ZONE	The name of the BOSH availability zone.
ID	The BOSH GUID.
ENVIRONMENT	An optional custom label to identify the BOSH environment.

Log lines use the following format:

```
<$PRI>$VERSION $TIMESTAMP $HOST $APP_NAME $PROC_ID $MSG_ID
[instance@ENTERPRISE_NUMBER director="$DIRECTOR" deployment="$DEPLOYMENT"
group="$INSTANCE_GROUP" az="$AVAILABILITY_ZONE" id="$ID"
environment="$ENVIRONMENT"] $MESSAGE
```

Example log messages:

```
<14>1 2017-01-25T13:25:03.18377Z 192.0.2.10 etcd - - [instance@47450
director="test-env" deployment="cf-c42ae2c4dfb6f67b6c27" group="diego_database" az
="us-west1-a"
id="83bd66e5-3fdf-44b7-bdd6-508deae7c786"] [INFO] the leader is
[https://diego-database-0.etcd.service.cf.internal:4001]
<14>1 2017-01-25T13:25:03.184491Z 192.0.2.10 bbs - - [instance@47450
director="test-env" deployment="cf-c42ae2c4dfb6f67b6c27" group="diego_database" az
="us-west1-a"
id="83bd66e5-3fdf-44b7-bdd6-508deae7c786"]
{"timestamp": "1485350702.539694548", "source": "bbs", "message":
"bbs.request.start-actual-lrp.starting", "log_level": 1, "data":}
```

```
{
  "actual_lrp_instance_key": {
    "instance_guid": "271f71c7-4119-4490-619f-4f44694717c0",
    "cell_id": "diego_cell-2-41f21178-d619-4976-901c-325bc2d0d11d"
  },
  "actual_lrp_key": {
    "process_guid": "1545ce89-01e6-4b8f-9cb1-5654a3ecae10-137e7eb4-12de-457d-8e3e-1258e5a74687",
    "index": 5,
    "domain": "cf-apps",
    "method": "POST",
    "net_info": {
      "address": "192.0.2.12",
      "ports": [
        {
          "container_port": 8080,
          "host_port": 61532
        },
        {
          "container_port": 2222,
          "host_port": 61533
        }
      ]
    },
    "request": "/v1/actual_lrps/start",
    "session": "418.1"
  }
}
```

## Edit which logs TAS for VMs forwards

When you enable log forwarding, all log lines written to the `/var/vcap/sys/log` directories in all TAS for VMs virtual machines (VMs) will be forwarded to your configured external syslog aggregation service.

To configure TAS for VMs to forward a subset of logs instead of forwarding all logs:

1. Go to the Tanzu Operations Manager Installation Dashboard.
2. Click the TAS for VMs tile.
3. Select **System Logging**.
4. In the **Custom rsyslog configuration** field, enter a custom syslog rule. See the following custom syslog rules example.
5. Click **Save**.

The custom rsyslog rules shown here are written in [RainerScript](#). The custom rules are inserted before the rule that forwards logs. The `stop` command, `stop`, prevents logs from reaching the forwarding rule. This filters out these logs.

Logs filtered out before forwarding remain on the local disk, where the BOSH job originally wrote them. These logs remain on the local disk only until BOSH Director recreates the VMs. You can access these logs from Tanzu Operations Manager or through SSH.

TAS for VMs requires a valid custom rule to forward logs. If your custom rule contains syntax errors, TAS for VMs forwards no logs.

## Forward only logs from a certain job

This rule filters out logs unless they originate from the `uaa` job:

```
if ($app-name != "uaa") then stop
```

## Exclude logs with certain content

This rule filters out logs that contain “DEBUG” in the body.

```
if ($msg contains "DEBUG") then stop
```

The previous example contains “DEBUG” in the message body. Not all logs intended for debugging purposes contain the string “DEBUG” in the message body.

## Monitoring

In this section:

- [Monitoring TAS for VMs](#)
- [Selecting and configuring a monitoring system](#)
- [Identifying TAS for VMs jobs using vCenter](#)

## Monitoring TAS for VMs

You can monitor their VMware Tanzu Application Service for VMs (TAS for VMs) deployments using the instructions provided in these topics. For information about monitoring VMware Tanzu Kubernetes Grid Integrated Edition (TKGI) deployments, see [Logging and monitoring TKGI](#).

For more information about logging and metrics in TAS for VMs, see [Overview of logging and metrics](#).

## KPI and scaling changes from TAS for VMs v2.11 to TAS for VMs v6.0

There are no changes to key performance indicator (KPI) or scaling recommendations from VMware Tanzu Application Service for VMs (TAS for VMs) v2.11 to TAS for VMs v6.0.

## Monitor services

For information about KPIs and metrics for services, see:

- **VMware Tanzu SQL [MySQL]:** [Monitoring VMware Tanzu SQL \[MySQL\]](#).
- **VMware Tanzu Gemfire:** [Monitoring VMware Tanzu GemFire Service Instances](#).
- **Redis for VMware Tanzu:** [Monitoring Redis for VMware Tanzu](#)
- **VMware Tanzu RabbitMQ (pre-provisioned):** [Monitoring and KPIs for Pre-Provisioned VMware Tanzu RabbitMQ](#)
- **VMware Tanzu RabbitMQ (on-demand):** [Monitoring and KPIs for On-Demand VMware Tanzu RabbitMQ](#)

## Selecting and configuring a monitoring system

You can select and configure a system to continuously monitor Operations Manager component performance and health.

## Selecting a monitoring platform

VMware recommends using [Healthwatch](#) to monitor your deployment. Healthwatch is a service tile developed and supported by VMware and available on [Broadcom Support](#).

Many third-party systems can also be used to monitor an Operations Manager deployment.

## Monitoring platform types

Monitoring platforms support two types of monitoring:

- A *dashboard* for active monitoring when you are at a keyboard and screen
- Automated *alerts* for when your attention is elsewhere

Some monitoring solutions offer both in one package. Others require putting the two pieces together.

## Monitoring platforms

There are many monitoring options available, both open source and commercial products. Some commonly used platforms among Operations Manager customers include:

- [Healthwatch](#) by VMware
- VMware Partner Services available on [Broadcom Support](#):
  - [AppDynamics](#)
  - [Datadog](#)
  - [Dynatrace](#)
  - [New Relic](#)
  - [Tanzu Observability by WaveFront](#)
- Other Commercial Services
  - [VMware vRealize Operations \(vROPS\)](#)
- Open-Source Tooling
  - [Prometheus + Grafana](#)
  - [OpenTSDB](#)

## VMware Cloud Ops tools

The VMware Cloud Ops Team manages two types of deployments for internal VMware use: open-source Cloud Foundry, and Operations Manager.

For **Cloud Foundry**, VMware Cloud Ops uses several monitoring tools. The [Datadog Config repository](#) provides an example of how the VMware Cloud Ops team uses a customized Datadog dashboard to monitor the health of its open-source Cloud Foundry deployments.

To monitor **Operations Manager** deployments, VMware Cloud Ops leverages a combination of [Healthwatch](#) and [Google Stackdriver](#).

## Key inputs for platform monitoring

### BOSH VM and Operations Manager component health metrics

Most monitoring service tiles for Operations Manager come packaged with the Firehose nozzle necessary to extract the BOSH and Operations Manager metrics leveraged for platform monitoring. Nozzles are programs that consume data from the Loggregator Firehose. Nozzles can be configured to select, buffer, and transform data, and to forward it to other apps and services.

The nozzles gather the component logs and metrics streaming from the Loggregator Firehose endpoint. For more information about the Firehose, see [Loggregator architecture](#).

As of v2.0, both BOSH VM Health metrics and Operations Manager component metrics stream through the Firehose by default.

- Operations Manager component metrics originate from the Metron agents on their source components, then travel through Dopplers to the Traffic Controller.
- The Traffic Controller aggregates both metrics and log messages system-wide from all Dopplers, and emits them from its Firehose endpoint.

For information about high-signal-value metrics and capacity scaling indicators in an Operations Manager deployment, see [Key Performance Indicators](#) and [Key capacity scaling indicators](#).

## Continuous functional smoke tests

Operations Manager includes smoke tests, which are functional unit and integration tests on all major system components. By default, whenever an operator upgrades to a new version of VMware Tanzu Application Service for VMs (TAS for VMs), these smoke tests run as a post-deploy errand.

VMware recommends additional higher-resolution monitoring by the execution of continuous smoke tests, or Service Level Indicator tests, that measure user-defined features and check them against expected levels.

- [Healthwatch](#) automatically runs these tests for TAS for VMs Service Level Indicators.
- The VMware Cloud Ops [Cloud Foundry smoke tests](#) repository offers additional testing examples.

For information about how to set up Concourse to generate custom component metrics, see [Metrics](#) in the Concourse documentation.

## Warning and critical thresholds

To properly configure your monitoring dashboard and alerts, you must establish what thresholds should drive alerting and red/yellow/green dashboard behavior.

Some key metrics have more fixed thresholds, with similar threshold numbers recommended across different foundations and use cases. These metrics tend to revolve around the health and performance of key components that can impact the performance of the entire system.

Other metrics of operational value are more dynamic in nature. This means that you must establish a baseline and yellow/red thresholds suitable for your system and its use cases. You can establish initial baselines by watching values of key metrics over time and noting what seems to be a good starting threshold level that divides acceptable and unacceptable system performance and health.

## Continuous evolution

Effective platform monitoring requires continuous evolution.

After you establish initial baselines, VMware recommends that you continue to refine your metrics and tests to maintain the appropriate balance between early detection and reducing unnecessary alert fatigue. You should occasionally revisit the dynamic measures recommended in [Key performance indicators](#) and [Key capacity scaling indicators](#) to ensure they are still appropriate to the current system configuration and its usage patterns.

## Identifying TAS for VMs jobs using vCenter

To effectively monitor, control, and manage the virtual machines that make up your VMware Tanzu Application Service for VMs (TAS for VMs) deployment, you might have to identify which VM corresponds to a particular job in TAS for VMs. You can find the CID of a particular VM from Tanzu Operations Manager by navigating to the **Status** tab in the TAS for VMs tile.

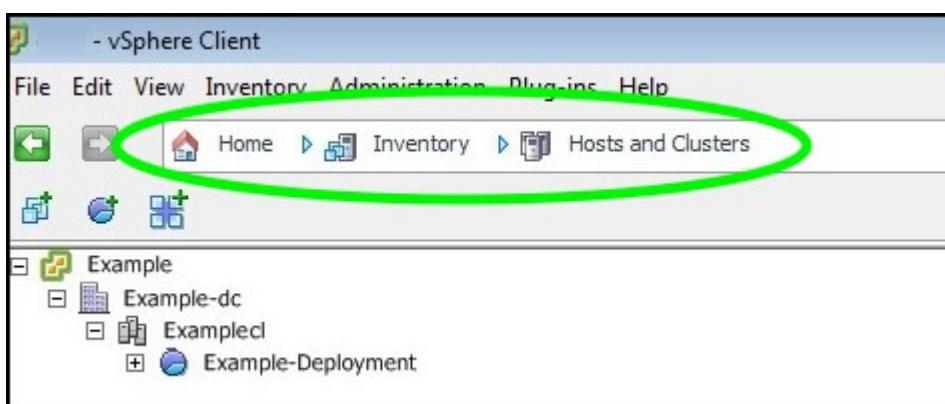
If you deployed TAS for VMs to VMware vSphere, you can also identify which TAS for VMs job corresponds to which VM using the vCenter vSphere client.

The CID shown in Tanzu Operations Manager is the name of the machine in vCenter.

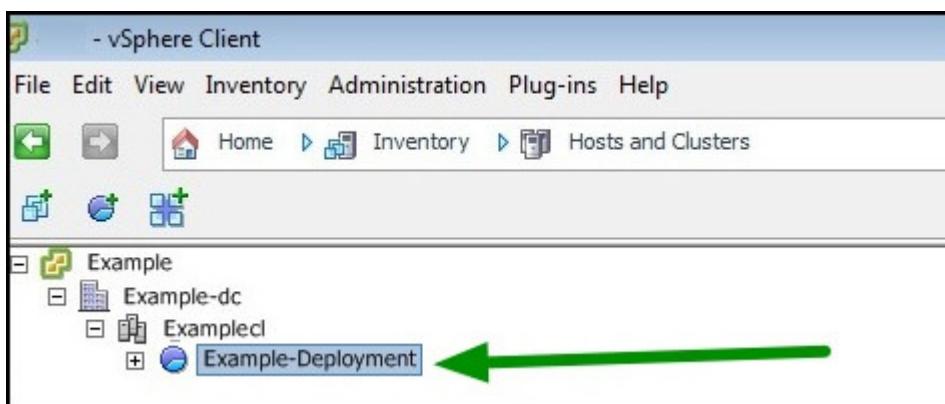
## Identifying TAS for VMs jobs using vCenter

To identify TAS for VMs jobs using vCenter:

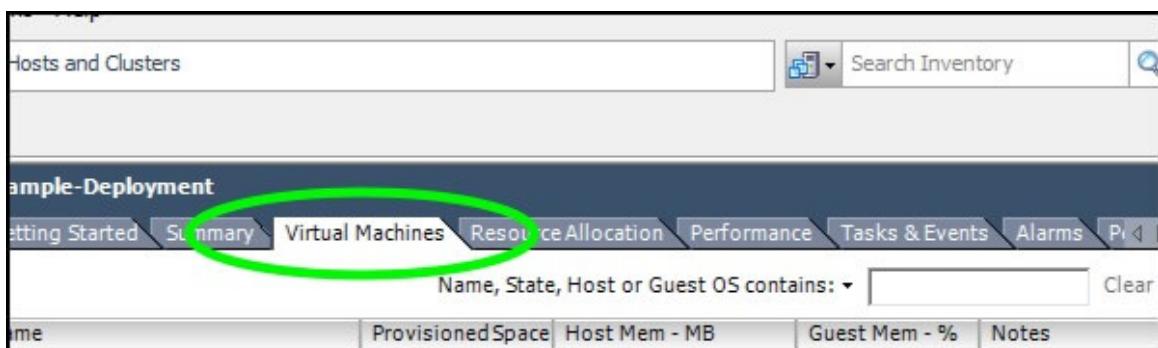
1. Start the vSphere client and log in to the vCenter Server system.
2. Select the **Inventory > Hosts and Clusters** view.



3. Select the Resource Pool containing your TAS for VMs deployment.



4. Click the **Virtual Machines** tab.



- Right-click the column label heading and select **job**. The **job** column displays the TAS for VMs job associated with each virtual machine.

The screenshot shows a software interface titled "Example-Deployment". At the top, there are tabs: Getting Started, Summary, Virtual Machines (which is selected), Resource Allocation, Performance, Tasks & Events, and Alarms. Below the tabs is a search bar with the placeholder "Name, State, Host or Guest OS contains: " and a "Clear" button. The main area is a table with two columns: "Name" and "job". The "Name" column lists numerous VM names, each preceded by a green icon. The "job" column lists the associated job names for each VM. A vertical scrollbar is visible on the right side of the table.

Name	job
vm-347a89c6-115f-433a-83d1-38cd2c31451b	ccdb
sc-d3520bac-11c2-460f-aa02-60fc11cba375	cloud_controller
vm-d537f816-fc51-450c-8ada-cb536a9e76f5	consoledb
vm-85d43147-7cd2-4cc5-ac6c-47cce18ccd69	dea
vm-5c04a27a-ca70-4f67-a221-767efb76922a	ha_proxy
vm-e9b3e319-690f-44be-87fb-ce97f90c4bc2	health_manager
vm-af8bd3d1-7e31-47f3-800f-3f81ff23ed81	loggregator
vm-ee8b5374-bbc9-436b-bfe5-1a7e2b5fee9a	loggregator_trafficcontroller
vm-5896908f-15c5-4989-8c90-36a36e0eb4fd	nats
vm-61fc0d19-01f5-4434-82e0-a11e15b388a8	nfs_server
vm-e88725cd-36fe-4a79-b8ea-f35b2d2cd85b	riak-cs
vm-9ab66b39-4cae-443a-842c-3651c9bf228c	router
vm-2726dcaa-7f92-440c-906e-3e5e544fe628	saml_login
vm-273df76f-7141-432d-9e53-9cb6549d870a	uaa
vm-307a34f4-ed7f-4c48-94d1-bb7a61a695bc	uaadb
vm-e6c2dfcd-ef2e-40d8-af0b-06e5f3e73fa9	
vm-0e9e9384-0057-4efc-9cea-234b5956c510	
vm-5e33e793-0118-44bb-948d-3ea6526b4b2f	

## App Metrics

In this section:

- Container metrics
- Metric Registrar and custom app metrics
- Using Metric Registrar
- Identifying the source deployment of metrics

## Container metrics

Here you can learn about the metrics that are emitted by all containers managed by VMware Tanzu Application Service for VMs (TAS for VMs) and its scheduling system, Diego.

Application metrics include the container metrics, and any custom application metrics that developers create.

## Diego container metrics

Diego containers emit resource usage metrics for the application instance. Diego averages and emits each metric every 15 seconds.

The following table describes all Diego container metrics:

Metric	Description	Unit
cpu	CPU time used by an app instance as a percentage of a single CPU core.  This is usually no greater than <code>100% * the number of vCPUs on the host Diego cell</code> , but it might be more due to discrepancies in measurement timing.	float64
cpu_entitlement	CPU time used by an app instance as a percentage of its CPU entitlement.  At minimum, the CPU time that a Diego Cell allocates to an app instance is <code>min(app memory, 8 GB) * (Diego cell vCPUs/Diego cell memory) * 100%</code> . The operator of your TAS for VMs deployment can provide the <code>vCPUs/memory</code> ratio of the Diego Cell to developers. If a Diego Cell is not already working at capacity, or if other workloads on the Diego Cell are idle, the Diego Cell can allocate more than the minimum amount of CPU time to an app instance.	float64
memory	The amount of RAM memory in bytes that an app instance has used.	uint64
memory_quota	The amount of RAM memory in bytes that is available for an app instance to use.	float64
disk	The amount of disk space in bytes that an app instance has used.	float64
disk_quota	The amount of disk space in bytes that is available for an app instance to use.	float64
container_age	The age in nanoseconds of the Diego container.	float64
log_rate	The current log rate in bytes per second for an app instance.	float64
log_rate_limit	The log rate limit in bytes per second for an app instance.	float64
rx_bytes	Received network traffic in bytes for an app instance.	uint64
tx_bytes	Transmitted network traffic in bytes for an app instance.	uint64

The operator of your TAS for VMs deployment can [enable it to emit](#) the following additional, deprecated container metrics:

Metric	Description	Unit
absolute_entitlement	The amount of CPU time that a Diego Cell has allocated to an app instance, in nanoseconds.  At minimum, the CPU time that a Diego Cell allocates to an app instance is <code>min(app memory, 8 GB) * (Diego cell vCPUs/Diego cell memory) * 100%</code> . The operator of your TAS for VMs deployment can provide the <code>vCPUs/memory</code> ratio of the Diego Cell to developers. If a Diego Cell is not already working at capacity, or if other workloads on the Diego Cell are idle, the Diego Cell can allocate more than the minimum amount of CPU time to an app instance.	float64

Metric	Description	Unit
<code>absolute_usage</code>	The CPU time that an app instance has used, in nanoseconds.  <code>absolute_usage / absolute_entitlement</code> calculates a percentage of app instance usage per entitlement.	<code>float64</code>

The way that Diego emits container metrics differs depending on the version of Loggregator used in your TAS for VMs deployment:

- **Loggregator v1:** Diego emits most container metrics in a `ContainerMetric` envelope. Diego emits the `cpu_entitlement`, `container_age`, `log_rate`, and `log_rate_limit` container metrics in `ValueMetric` envelopes.
- **Loggregator v2:** Diego emits all container metrics in gauge and counter envelopes. Diego emits the `cpu_entitlement`, `container_age`, `log_rate`, and `log_rate_limit` container metrics in separate gauge envelopes from other container metrics. The container metrics come in five envelopes:
  - One envelope containing `cpu`, `disk`, `disk_quota`, `memory`, and `memory_quota`
  - One envelope containing `cpu_entitlement`, and `container_age`
  - One envelope containing `log_rate` and `log_rate_limit`
  - One envelope containing `rx_bytes`
  - One envelope containing `tx_bytes`

## Retrieving container metrics from the cf CLI

You can retrieve container metrics using the Cloud Foundry Command Line Interface (cf CLI).

- To retrieve CPU, memory, and disk metrics for all instances of an application, see [Retrieve CPU, memory, and disk metrics](#).
- To retrieve network traffic metrics for all instances of an app, see [Retrieve network traffic metrics](#).

### Retrieving CPU, Memory, and Disk metrics

To retrieve CPU, memory, and disk metrics for all instances of an application:

1. In a terminal window, run:

```
cf app APP-NAME
```

Where `APP-NAME` is the name of the app.

This command returns CPU, memory, and disk metrics for all instances of the app, similar to the following example:

```
Showing health and status for app dora-example in org o / space s as ad min...
```

Label in output	Metrics listed
cpu	CpuPercentage
memory	MemoryBytes of MemoryBytesQuota
disk	DiskBytes of DiskBytesQuota

The listed metrics are described in [Diego container metrics](#).

```
type:          web
sidecars:
instances:    1/1
memory usage: 1024M
      state   since           cpu     memory     disk      l
oggining       details
#0  running   2022-09-16T01:38:46Z   0.2%   36.3M of 1G   90.3M of 1G   0/
s of unlimited
```

The preceding command shows what percentage of CPU the app is currently using relative to the total CPU on the host machine.

## Retrieve network traffic metrics

To retrieve received- and transmitted bytes for all instances of an app:

1. Install the Log Cache CLI Plug-in from the [Log Cache cf CLI Plugin](#) repository on GitHub.
2. In a terminal window, run:

```
cf tail --name-filter="bytes" APP-NAME
```

Where `APP-NAME` is the name of the app.

This command returns `rx_bytes` and `tx_bytes` metrics for all instances of the app, similar to the following example:

```
2023-08-10T13:27:50.27+0000 [my-app/0] COUNTER rx_bytes:24842
2023-08-10T13:27:50.27+0000 [my-app/0] COUNTER tx_bytes:24306
2023-08-10T13:27:50.27+0000 [my-app/1] COUNTER rx_bytes:14832
2023-08-10T13:27:50.27+0000 [my-app/1] COUNTER tx_bytes:32312
```

## Metric Registrar and custom app metrics

Using Metric Registrar for VMware Tanzu Application Service for VMs (TAS for VMs), you can define and use your own custom app metrics.

You can activate and configure the Metric Registrar from the TAS for VMs tile.

App metrics include custom app metrics that you can export with Metric Registrar, and container metrics that are emitted by all TAS for VMs containers. For information about container metrics, see [Container metrics](#).

Metric Registrar allows you to export custom app metrics in a format that Loggregator can consume. You can use the custom metrics to monitor apps with App Metrics and configure autoscaling rules with App

Autoscaler.

If you are an App developer, you can export custom metrics to Loggregator by configuring your apps in one of the following ways:

- **Metrics Endpoint:** Publish and register a Prometheus Exposition metrics endpoint to an app. The Metric Registrar then polls this endpoint every 35 seconds and convert the metrics found in the response to Loggregator metrics.
- **Structured Log:** Edit your app to emit metrics using a specific JSON or DogStatsD format. The Metric Registrar then converts all matching log entries into Loggregator metrics or events.

For more information about installing the Metric Registrar plug-in and registering your app, see [Emitting custom App Metrics to Metric Registrar](#).

For more information about the components and products mentioned, see:

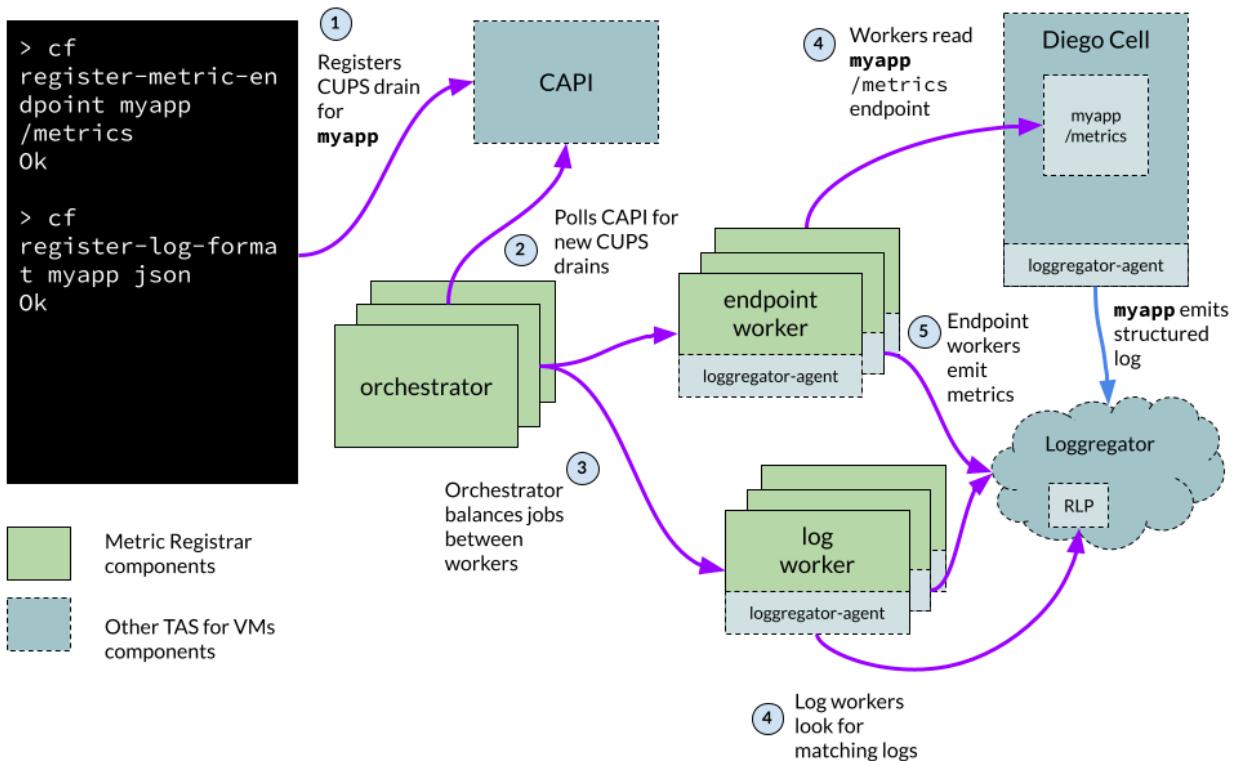
- [Loggregator](#)
- [App Metrics](#)
- [App Autoscaler](#)

## Architecture

The following diagram illustrates how the Metric Registrar sends your custom app metrics to Loggregator.

The components of the Metric Registrar are:

- The cf CLI plug-in
- The `metric_registrar_endpoint_worker` and `metric_registrar_log_worker` jobs running on the Doppler VM of the TAS for VMs deployment
- The `metric_registrar_orchestrator` and `metric_registrar_smoke_test` jobs running on the Clock Global VM of the TAS for VMs deployment



Click the image for a larger representation.

## Configuring Metric Registrar



The Metric Registrar is included with TAS for VMs, and you configure it in the TAS for VMs tile. You do not install and configure Metric Registrar as a separate product tile.

In the **Metric Registrar** pane, you configure the Metric Registrar. The Metric Registrar allows TAS for VMs to convert structured logs into metrics. It also scrapes metrics endpoints and forwards the metrics to Loggregator.

The Metric Registrar requires the V2 Firehose to be enabled. Ensure that **Enable V2 Firehose** is selected on the **System Logging** pane.

If you configure the Metric Registrar, VMware recommends that you also run the Metric Registrar smoke test errand. For more information, see [Configure smoke tests](#).

## Deactivate the Metric Registrar

By default, the Metric Registrar is deployed.

To deactivate the Metric Registrar:

1. Select **Metric Registrar**.
2. Deselect the **Deploy Metric Registrar** check box.
3. Click **Save**.

## Edit default scraping interval

The scraping interval defines how often the Metric Registrar polls custom metric endpoints. The default is 35 seconds.

To edit the Metric Registrar scraping interval:

1. Select **Metric Registrar**.
2. Edit the **Endpoint scraping interval** field.
3. Click **Save**.

## Add blocked tags

To prevent the Metric Registrar from consuming the value of a metric or event tag, you can add the tag to the **Blocked tags** field. For example, if you tag your metrics with a `customer_id`, you might want to add `customer_id` to the list of blocked tags.

By default, the following tags are blocked to prevent interference with other products like App Metrics that use and rely on such tags.

- `deployment`
- `job`
- `index`
- `id`

To prevent the Metric Registrar from consuming the value of a metric or event tag:

1. Select **Metric Registrar**.
2. Add the desired tags to the **Blocked tags** field in a comma-separated list.
3. Click **Save**.

## Edit app instance metrics limit per scraping interval

The **App instance metrics limit per scraping interval** field defines how many metrics are emitted per app instance per interval. If the number of metrics an app instance generates within a scraping interval exceeds the configured limit, no metrics are emitted. Each individual Prometheus value is counted as one metric, including multiple values within the same metric family. By default, there is no limit.

To configure a metrics limit per scraping interval for app instances:

1. Select **Metric Registrar**.
2. Edit the **App instance metrics limit per scraping interval** field.
3. Click **Save**.

## Using Metric Registrar

You can install the Metric Registrar CLI plug-in and emit custom app metrics to Metric Registrar by registering your app as a metric source.

For information about how Metric Registrar approaches custom App Metrics and how to configure Metric Registrar, see [Metric Registrar and custom App Metrics](#).

Registering your app as a metric source lets you see custom metrics in App Metrics and configure autoscaling rules with App Autoscaler.

For more information, see [App Metrics](#) and [Scaling an app using App Autoscaler](#).

## Install the plug-in

To install the Metric Registrar CLI plug-in:

1. Log in to the Cloud Foundry Command Line Interface (cf CLI).
2. Run:

```
cf install-plugin -r CF-Community "metric-registrar"
```

## Register your app

To register your app as a metric source, complete one of the following tasks:

- **Register a metrics endpoint:** Register a metrics endpoint for custom metrics to be parsed and emitted to Loggregator. For more information, see [Register a Metrics Endpoint](#).
- **Register a structured log format:** Register a structured log format that can be emitted to Loggregator. For more information, see [Register a Structured Log Format](#).

If you are migrating from and manually sending data to Metrics Forwarder, VMware, register a structured log format. For more information, see [Register a structured log format](#).

## Register a metrics endpoint

Metric Registrar supports custom metrics created with the open-source tool, Prometheus. Prometheus uses a text-based exposition format common in many open-source libraries. It also provides several out-of-the-box metrics for different programming languages.

Note that metrics endpoints must be served over HTTPS.

For more information about Prometheus, see [What is Prometheus?](#) in the Prometheus documentation.

For examples of apps that use Prometheus to publish metrics to an endpoint, see [metric-registrar-examples](#) in GitHub.



### Important

These endpoints are public by default. If you do not want to expose public metrics endpoints for your app, see [Register a Structured Log Format](#) below.

## Prerequisites

Before registering a metrics endpoint, you must:

- For all Spring apps, update the `application.yml` file to include one or more Prometheus endpoints. For example:

```
management:
  endpoints:
    web:
      exposure:
        include: "prometheus"
```

- For all Spring apps, update the security configuration file to permit access to the Prometheus endpoints. For an example, see [metric-registrar-examples](#) in GitHub.
- For all other apps, see [Client libraries](#) in the Prometheus documentation.

## Register a public metrics endpoint

To register a public metrics endpoint for an app:

- Log in to the cf CLI.
- For each Prometheus endpoint in your app, register the endpoint as a metric source:

```
cf register-metrics-endpoint APP-NAME PATH-OR-URL --insecure
```

Where:

- `APP-NAME` is the name of the app.
- `PATH-OR-URL` is the path to the Prometheus endpoint, or a URL without the scheme.

For example, if the app name is `example` and the metrics endpoint is at <https://example.com/metrics>, the command is:

```
cf register-metrics-endpoint example /metrics --insecure
```

Or, if pulling metrics by specifying an alternative route also mapped to the same app:

```
cf register-metrics-endpoint example otherexample.com/metrics --insecure
```



### Important

When you specify a URL to a metrics endpoint, the scheme must be omitted and the URL must use HTTPS. When you specify a path to a metrics endpoint, the path must start with a slash ('/') character. Each metrics endpoint registered with Metric Registrar creates a service instance. If the generated service name is longer than 50 characters, it's encoded with a hash. In Metric Registrar v1.3.1 and later, you must use the `--insecure` flag for the same values that you provided in previous versions.

## Verifying a metrics endpoint

VMware recommends that you install the LogCache cf CLI plug-in to view metrics.

To install and use the Log Cache cf CLI plug-in:

1. To install Log Cache, run:

```
cf install-plugin -r CF-Community "log-cache"
```

2. To view metrics for an app, run:

```
cf tail --envelope-class=metrics APP-NAME
```

Where `APP-NAME` is the name of your app.

For example, if you provide a custom metric called `users_per_cpu` as a gauge, you see the following output:

```
2019-06-18T10:49:28.27-0600 [app-name/1] GAUGE cpu:0.154763 percentage
disk:14000128.000000 bytes disk_quota:33554432.000000 bytes memory:1019
0848.000000 bytes memory_quota:33554432.000000 bytes
2019-06-18T10:49:26.42-0600 [app-name/1] GAUGE users_per_cpu:557.500000
```

Where the first line is default container metrics and the second line is custom app metrics `users_per_cpu`.



### Important

Metric Registrar produces the following benign error message at every polling interval: `[LGR/] ERR Invalid syslog drain URL: parse failure`

## Registering a private metrics endpoint

To register a private metrics endpoint:

1. Set up a Prometheus endpoint that serves on any port other than 8081.
2. Register the endpoint:

```
cf register-metrics-endpoint APP-NAME PATH --internal-port PORT
```

Where:

- `APP-NAME` is the name of the app.
- `PATH` is the path to the Prometheus endpoint.
- `PORT` is the port where the Prometheus endpoint is served.

## Register a structured log format

Metric Registrar supports metrics emitted in JSON or DogStatsD formats. For more information see [JSON](#) and [DogStatsD](#).

To register your app as a metric source:

1. Log in to the cf CLI.

2. Run:

```
cf register-log-format APP-NAME FORMAT
```

Where:

- `APP-NAME` is the name of your app.
- `FORMAT` is either `'json'` or `'DogStatsD'`.

3. In your app, log a structured `json` or `DogStatsD` message to represent the custom metric.

### Supported JSON format

The following table shows the supported JSON format for event, gauge, and counter log types.

Type	Format
Events	<pre>{     "type": "event",     "title": "title",     "body": "body",     "tags": {         "tag1": "tag value"     } }</pre>
Gauges	<pre>{     "type": "gauge",     "name": "some-counter",     "value": ,     "tags": {         "tag1": "tag value"     } }</pre>
Counters	<pre>{     "type": "counter",     "name": "some-counter",     "delta": ,     "tags": {         "tag1": "tag value"     } }</pre>

### DogStatsD Log format

The following table shows the supported DogStatsD format for event, gauge, and counter log types. It also lists the supported fields. For more information about DogStatsD, see [DogStatsD](#) in the Datadog

documentation.

Type	Format	Supported Fields
Events	<pre>_e{title.length, text.length}:title text d:timestamp  h:hostname p:priority t:alert_type #tag1, tag2</pre>	title text
Gauges	<pre>gauge.name:value g @sample_rate #tag1:value, tag2</pre>	gauge.name value
Counters	<pre>counter.name:value c @sample_rate #tag1:value, tag2</pre>	counter.name value

## Register using syslog drain User Provided Service

Metric Registrar uses the syslog drain User Provided Service.

To create a Metric Registrar Service, run the following command:

1. Create the service:

```
cf create-user-provided-service SERVICE-NAME -l BINDING
```

Where:

- **SERVICE-NAME** is the name you choose for the service.
- **BINDING** is the service binding. The binding can use the following schemes:
  - `secure-endpoint://`
  - `metrics-endpoint://`
  - `structured-format://`

2. Bind the provided service:

```
cf bind-service APP-NAME SERVICE-NAME
```

Where:

- **APP-NAME** is the name of the app.
- **SERVICE-NAME** is the service name you chose in the previous step.

Metric Registrar supports metrics emitted in JSON or DogStatsD formats. For metrics endpoints, the rest of the URI specifies the host, port, and path of the metrics endpoint.

For example:

```
secure-endpoint://:8081/metrics
metrics-endpoint:///metrics
structured-format://json
```

For a secure endpoint, you must expose the additional port you are serving on using Diego.

For example:

```
cf curl /v2/apps/APP-GUID -X PUT -d '{"ports": [PORT1, PORT2, PORT3...]}'
```

Where:

- `APP-GUID` is the GUID of your app.
- `PORT1, PORT2, PORT3...` is a comma separated list of the ports on which you want your app to receive traffic.

## Identifying the source deployment of metrics

You can read app metrics metadata to identify which Operations Manager product generated the metrics, and to retrieve other information about the metrics source.

For example, you might want to distinguish between metrics coming from apps hosted by VMware Tanzu Application Service for VMs (TAS for VMs) itself and apps hosted by an Isolation Segment deployment.

## Source deployment from tile GUID

Metrics identify their source deployment with a `deployment` tag followed by `cf-` prefixed to the GUID of the source Operations Manager tile. You can use this GUID to identify which tile deployed the Diego Cells generating the metrics.

## Human-friendly metadata

TAS for VMs and other runtime tiles tag metrics with additional metadata to help users parse metrics coming from different deployments. Downstream monitoring products such as Healthwatch also use this metadata to display human-readable names.

The tags are:

- `product`: The value of this tag is always `VMware Tanzu Application Service` for the TAS for VMs tile. The tags for other products are: `Isolation Segment`, `Small Footprint VMware Tanzu Application Service`, and `VMware Tanzu Application Service for Windows`.
- `system_domain`: The value of this tag corresponds to what you set in the **System domain** field in the **Domains** pane of a given tile.
- `placement_tag`: The value of this tag is always `null` for TAS for VMs. However, for VMware Tanzu Application Service for VMs [Windows] (TAS for VMs [Windows]) and Isolation Segment tiles, you can configure this value using the **Segment name** field in the **App Containers** pane. An operator can display capacity and other relevant metrics using the `placement_tag` name. This makes it easier to reason about the importance of a given segment when issues arise.

These tags are properties of the Metron agent running on each VM in a deployment.

## Performance and scaling

In this section:

- [Key performance indicators](#)
- [Key capacity scaling indicators](#)

## Key performance indicators

The KPIs described here are provided for operators to give general guidance on monitoring a TAS for VMs deployment using platform component and system (BOSH) metrics. Although many metrics are emitted from the platform, the KPIs are high-signal-value metrics that can indicate emerging platform issues.

This alerting and response guidance has been shown to apply to most deployments. VMware recommends that operators continue to fine-tune the alert measures to their deployment by observing historical trends. VMware also recommends that operators expand beyond this guidance and create new, deployment-specific monitoring metrics, thresholds, and alerts based on learning from their deployments.

Thresholds noted as “dynamic” in the following tables indicate that while a metric is highly important to watch, the relative numbers to set threshold warnings at are specific to a given TAS for VMs deployment and its use cases. These dynamic thresholds should be occasionally revisited because the foundation and its usage continue to evolve. For more information, see [Warning and Critical Thresholds](#) in *Selecting and Configuring a Monitoring System*.

While the performance impact on TAS for VMs is considered when building new features, VMware does not perform discrete load and scale testing on a regular basis. It is impossible to test each configuration of TAS for VMs with every type of infrastructure and app workload. Therefore, VMware recommends using the following KPIs to identify when to scale your system.

For more information about accessing metrics used in these key performance indicators, see [Overview of Logging and Metrics](#).

## Diego auctioneer metrics

These sections describe Diego Auctioneer metrics.

### Auctioneer app instance (AI) placement failures

#### **auctioneer.AuctioneerLRPAuctionsFailed**

<b>Description</b>	The number of Long Running Process (LRP) instances that the Auctioneer failed to place on Diego Cells. This metric is cumulative over the lifetime of the Auctioneer job.
--------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Use:** This metric can indicate that TAS for VMs is out of container space or that there is a lack of resources within your environment. This indicator also increases when the LRP is requesting an isolation segment, volume drivers, or a stack that is unavailable, either not deployed or lacking sufficient resources to accept the work.

This metric is emitted on event, and therefore gaps in receipt of this metric can be normal during periods of no app instances being scheduled.

This error is most common due to capacity issues. For example, if Diego Cells do not have enough resources, or if Diego Cells are going back and forth between a healthy and unhealthy state.

**Origin:** Firehose

**Type:** Counter (Integer)

**Frequency:** During each auction

**auctioneer.AuctioneerLRPAuctionsFailed**

<b>Recommended measurement</b>	Per minute delta averaged over a 5-minute window
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 0.5$ <b>Red critical:</b> $\geq 1$
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. To best determine the root cause, examine the Auctioneer logs. Depending on the specific error and resource constraint, you might also find a failure reason in the Cloud Controller (CC) API.</li> <li>2. Investigate the health of your Diego Cells to determine if they are the resource type causing the problem.</li> <li>3. Consider scaling additional Diego Cells using Tanzu Operations Manager.</li> <li>4. If scaling Diego Cells does not solve the problem, pull Diego Brain logs and BBS node logs and contact Support telling them that LRP auctions are failing.</li> </ol>

**Auctioneer time to fetch Diego Cell state****auctioneer.AuctioneerFetchStatesDuration**

<b>Description</b>	Time in ns that the Auctioneer took to fetch state from all the Diego Cells when running its auction.
<p><b>Use:</b> Indicates how the Diego Cells themselves are performing. Alerting on this metric helps alert that app staging requests to Diego might be failing.</p> <p><b>Origin:</b> Firehose  <b>Type:</b> Gauge, integer in ns  <b>Frequency:</b> During event, during each auction</p>	
<b>Recommended measurement</b>	Maximum over the last 5 minutes divided by 1,000,000,000
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 2$ s <b>Red critical:</b> $\geq 5$ s
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Check the health of the Diego Cells by reviewing the logs and looking for errors.</li> <li>2. Review IaaS console metrics.</li> <li>3. Inspect the Auctioneer logs to determine if one or more Diego Cells is taking significantly longer to fetch state than other Diego Cells. Relevant log lines have wording like `fetched Diego Cell state`.</li> <li>4. Pull Diego Brain logs, Diego Cell logs, and Auctioneer logs and contact Support telling them that fetching Diego Cell states is taking too long.</li> </ol>

**Auctioneer app instance starts**

**auctioneer.AuctioneerLRPAuctionsStarted**

<b>Description</b>	The number of LRP instances that the Auctioneer successfully placed on Diego Cells. This metric is cumulative over the lifetime of the Auctioneer job.
<b>Use:</b>	Provides a sense of running system activity levels in your environment. Can also give you a sense of how many app instances have been started over time. The measurement VMware recommends can help indicate a significant amount of container churn. However, for capacity planning purposes, it is more helpful to observe deltas over a long time window.
	This metric is emitted on event, and therefore gaps in receipt of this metric can be normal during periods of no app instances being scheduled.
<b>Origin:</b>	Firehose
<b>Type:</b>	Counter (Integer)
<b>Frequency:</b>	During event, during each auction
<b>Recommended measurement</b>	Per minute delta averaged over a 5-minute window
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	When observing a significant amount of container churn: <ol style="list-style-type: none"> <li>1. Look to eliminate explainable causes of temporary churn, such as a deployment or increased developer activity.</li> <li>2. If container churn appears to continue over an extended period, pull logs from the Diego Brain and BBS node before contacting Support.</li> </ol> When observing extended periods of high or low activity trends, scale TAS for VMs components up or down as needed.

## Auctioneer task placement failures

**auctioneer.AuctioneerTaskAuctionsFailed**

<b>Description</b>	The number of Tasks that the Auctioneer failed to place on Diego Cells. This metric is cumulative over the lifetime of the Auctioneer job.
<b>Use:</b>	Failing Task auctions indicate a lack of resources within your environment and that you likely need to scale. This indicator also increases when the Task is requesting an isolation segment, volume drivers, or a stack that is unavailable, either not deployed or lacking sufficient resources to accept the work.
	This metric is emitted on event, and therefore gaps in receipt of this metric can be normal during periods of no tasks being scheduled.
	This error is most common due to capacity issues. For example, if Diego Cells do not have enough resources, or if Diego Cells are going back and forth between a healthy and unhealthy state.
<b>Origin:</b>	Firehose
<b>Type:</b>	Counter (Float)
<b>Frequency:</b>	During event, during each auction
<b>Recommended measurement</b>	Per minute delta averaged over a 5-minute window
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 0.5$ <b>Red critical:</b> $\geq 1$
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. To best determine the root cause, examine the Auctioneer logs. Depending on the specific error or resource constraint, you might also find a failure reason in the CC API.</li> <li>2. Investigate the health of Diego Cells.</li> <li>3. Consider scaling additional Diego Cells using Tanzu Operations Manager.</li> <li>4. If scaling Diego Cells does not solve the problem, pull Diego Brain logs and BBS logs for troubleshooting and contact Support for additional troubleshooting. Inform Support that Task auctions are failing.</li> </ol>

## Diego BBS metrics

These sections describe Diego BBS metrics.

### BBS time to run LRP convergence

**bbs.ConvergenceLRPDuration**

<b>Description</b>	Time in ns that the BBS took to run its LRP convergence pass.
<b>Use:</b>	If the convergence run begins taking too long, apps or tasks might fail without restarting. This symptom can also indicate loss of connectivity to the BBS database.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Integer in ns)
<b>Frequency:</b>	During event, every 30 seconds when LRP convergence runs, emission should be near-constant on a running deployment
<b>Recommended measurement</b>	Maximum over the last 15 minutes divided by 1,000,000,000
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 10$ s <b>Red critical:</b> $\geq 20$ s
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Check BBS logs for errors.</li> <li>2. Try vertically scaling the BBS VM resources up. For example, add more CPUs or memory depending on its <code>system.cpu/system.memory</code> metrics.</li> <li>3. Consider vertically scaling the TAS for VMs backing database, if <code>system.cpu</code> and <code>system.memory</code> metrics for the database instances are high.</li> <li>4. If that does not solve the issue, pull the BBS logs and contact Support for additional troubleshooting.</li> </ol>

**BBS time to handle requests****bbs.RequestLatency**

<b>Description</b>	The maximum observed latency time over the past 60 seconds that the BBS took to handle requests across all its API endpoints.  Diego now aggregates this metric to emit the maximum value observed over 60 seconds.
<b>Use:</b>	If this metric rises, the TAS for VMs API is slowing. Response to certain of CLI commands is slow if request latency is high.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Integer in ns)
<b>Frequency:</b>	60 s
<b>Recommended measurement</b>	Average over the last 15 minutes divided by 1,000,000,000
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 5$ s <b>Red critical:</b> $\geq 10$ s

**bbs.RequestLatency****Recommended response**

1. Check CPU and memory statistics in Tanzu Operations Manager.
2. Check BBS logs for faults and errors that can indicate issues with BBS.
3. Try scaling the BBS VM resources up. For example, add more CPUs and memory depending on its `system.cpu/system.memory` metrics.
4. Consider vertically scaling the TAS for VMs backing database, if `system.cpu` and `system.memory` metrics for the database instances are high.
5. If the previous steps do not solve the issue, collect a sample of the Diego Cell logs from the BBS VMs and contact Support to troubleshoot further.

## Cloud Controller and Diego in sync

**bbs.Domain.cf-apps**

**Description** Indicates if the `cf-apps` Domain is up-to-date, meaning that TAS for VMs app requests from Cloud Controller are synchronized to `bbs.LRPsDesired` (Diego-desired ALs) for execution.

- `1` means `cf-apps` Domain is up-to-date
- No data received means `cf-apps` Domain is not up-to-date

**Use:** If the `cf-apps` Domain does not stay up-to-date, changes requested in the Cloud Controller are not guaranteed to propagate throughout the system. If the Cloud Controller and Diego are out of sync, then apps running can vary from those desired.

**Origin:** Firehose

**Type:** Gauge (Float)

**Frequency:** 30 s

**Recommended measurement**

Value over the last 5 minutes

**Recommended alert thresholds**

**Yellow warning:** N/A

**Red critical:** ≠ 1

The threshold value VMware recommends represents a state where an up-to-date metric `1` has not been received for the entire 5-minute window.

**Recommended response**

1. Check the BBS and Clock Global (Cloud Controller clock) logs.
2. If the problem continues, pull the BBS logs and Clock Global (Cloud Controller clock) logs and contact Support to say that the `cf-apps` domain is not being kept fresh.

## More app instances than expected

**bbs.LRPsExtra**

<b>Description</b>	Total number of LRP instances that are no longer desired but still have a BBS record. When Diego wants to add more apps, the BBS sends a request to the Auctioneer to spin up additional LRPs. LRPsExtra is the total number of LRP instances that are no longer desired but still have a BBS record.
<b>Use:</b>	If Diego has more LRPs running than expected, there might be problems with the BBS.
	Deleting an app with many instances can temporarily spike this metric. However, a sustained spike in <code>bbs.LRPsExtra</code> is unusual and should be investigated.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float)
<b>Frequency:</b>	30 s
<b>Recommended measurement</b>	Average over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 5$ <b>Red critical:</b> $\geq 10$
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>Review the BBS logs for proper operation or errors, looking for detailed error messages.</li> <li>If the condition persists, pull the BBS logs and contact support.</li> </ol>

## Fewer app instances than expected

**bbs.LRPsMissing**

<b>Description</b>	Total number of LRP instances that are desired but have no record in the BBS. When Diego wants to add more apps, the BBS sends a request to the Auctioneer to spin up additional LRPs. LRPsMissing is the total number of LRP instances that are desired but have no BBS record.
<b>Use:</b>	If Diego has less LRP running than expected, there might be problems with the BBS.
	An app push with many instances can temporarily spike this metric. However, a sustained spike in <code>bbs.LRPsMissing</code> is unusual and should be investigated.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float)
<b>Frequency:</b>	30 s
<b>Recommended measurement</b>	Average over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 5$ <b>Red critical:</b> $\geq 10$

**bbs.LRPsMissing****Recommended response**

1. Review the BBS logs for proper operation or errors, looking for detailed error messages.
2. If the condition persists, pull the BBS logs and contact Support.

## Crashed app instances

**bbs.CrashedActualLRPs**

<b>Description</b>	Total number of LRP instances that have crashed.
--------------------	--------------------------------------------------

**Use:** Indicates how many instances in the deployment are in a crashed state. An increase in `bbs.CrashedActualLRPs` can indicate several problems, from a bad app with many instances associated, to a platform issue that is resulting in app crashes. Use this metric to help create a baseline for your deployment. After you have a baseline, you can create a deployment-specific alert to notify of a spike in crashes higher than the trend line. Tune alert values to your deployment.

**Origin:** Firehose

**Type:** Gauge (Float)

**Frequency:** 30 s

<b>Recommended measurement</b>	Average over the last 5 minutes
--------------------------------	---------------------------------

<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
-------------------------------------	----------------------------------------------------------------

**Recommended response**

1. Look at the BBS logs for apps that are crashing and at the Diego Cell logs to see if the problem is with the apps themselves, rather than a platform issue.
2. Before contacting Support, pull the BBS logs and, if particular apps are the problem, pull the logs from their Diego Cells too.

## Running app instances, rate of change

**1 hr average of bbs.LRPsRunning – prior 1 hr average of bbs.LRPsRunning**

<b>Description</b>	Rate of change in app instances being started or stopped on the platform. It is derived from <code>bbs.LRPsRunning</code> and represents the total number of LRP instances that are running on Diego Cells.
--------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Use:** Delta reflects upward or downward trend for app instances started or stopped. Helps to provide a picture of the overall growth trend of the environment for capacity planning. You might want to alert on delta values outside of the expected range.

**Origin:** Firehose

**Type:** Gauge (Float)

**Frequency:** During event, emission must be constant on a running deployment

**1 hr average of bbs.LRPsRunning – prior 1 hr average of bbs.LRPsRunning**

<b>Recommended measurement</b>	derived=(1-hour average of <code>bbs.LRPsRunning</code> – prior 1-hour average of <code>bbs.LRPsRunning</code> )
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	Scale components as necessary.

**BBS master elected****bbs.BBSMasterElected**

<b>Description</b>	Indicates when there is a BBS master election. A BBS master election takes place when a BBS instance has taken over as the active instance. A value of <code>1</code> is emitted when the election takes place.
<b>Use:</b>	This metric emits when a redeployment of the BBS occurs. If this metric is emitted frequently outside of a deployment, this might be a signal of underlying problems that should be investigated. If the active BBS is continually changing, this can cause app push downtime.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float)
<b>Frequency:</b>	On event
<b>Recommended measurement</b>	<code>N/A</code> , the most effective visualization is as a stacked bar chart
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> <code>N/A</code> <b>Red critical:</b> <code>N/A</code>
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Check the BBS logs.</li> <li>2. Check the BBS VM load average and instance group size.</li> <li>3. Check the health of the connection to the backing SQL database and network latency.</li> </ol>

**Diego Cell metrics**

These sections describe Diego Cell metrics.

**Remaining memory available — Diego Cell memory chunks available**

**rep.CapacityRemainingMemory**

<b>Description</b>	Remaining amount of memory in MiB available for this Diego Cell to allocate to containers.
<b>Use:</b>	Indicates the available Diego Cell memory. Insufficient Diego Cell memory can prevent pushing and scaling apps.
	The strongest operational value of this metric is to interpret a deployment's average app size and monitor/alert on ensuring that at least some Cells have large enough capacity to accept standard app size pushes. For example, if pushing a 4 GB app, Diego can have trouble placing that app if there is no one Diego Cell with sufficient capacity of 4 GB or greater.
	As an example, VMware Cloud Ops uses a standard of 4 GB, and computes and monitors for the number of Diego Cells with at least 4 GB free. When the number of Diego Cells with at least 4 GB falls below a defined threshold, this is a scaling indicator alert to increase capacity. This <i>free chunk</i> count threshold should be tuned to the deployment size and the standard size of apps being pushed to the deployment.
	<b>Origin:</b> Firehose <b>Type:</b> Gauge (Integer in MiB) <b>Frequency:</b> 60 s
<b>Recommended measurement</b>	<p><b>For alerting:</b></p> <ol style="list-style-type: none"> <li>1. Determine the size of a standard app in your deployment. This is the suggested value to calculate <i>free chunks</i> of Remaining Memory by.</li> <li>2. Create a script/tool that can iterate through each Diego Cell and do the following:             <ol style="list-style-type: none"> <li>1. Pull the <code>rep.CapacityRemainingMemory</code> metric for each Diego Cell.</li> <li>2. Divide the values received by 1000 to get the value in GB (threshold is GB-based).</li> <li>3. Compare recorded values to your minimum capacity threshold, and count the number of Diego Cells that have equal or greater than the desired amount of <i>free chunk</i> space.</li> </ol> </li> <li>3. Determine a desired scaling threshold based on the minimum amount of <i>free chunks</i> that are acceptable in this deployment given historical trends.</li> <li>4. Set an alert to indicate the need to scale Diego Cell memory capacity when the value falls below the desired threshold number.</li> </ol> <p><b>For visualization purposes:</b></p> <p>Looking at this metric (<code>rep.CapacityRemainingMemory</code>) as a minimum value per Diego Cell has more informational value than alerting value. It can be an interesting heatmap visualization, showing average variance and density over time.</p>
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Assign more resources to the Diego Cells or assign more Diego Cells.</li> <li>2. Scale additional Diego Cells using Tanzu Operations Manager.</li> </ol>
<b>Alternative Metric</b>	If you are using Healthwatch, VMware recommends using the metric <code>healthwatch.Diego.AvailableFreeChunks</code> . For more information, see <a href="#">Healthwatch Metrics</a> in the Healthwatch documentation.

**Remaining memory available — Overall remaining memory available**

**rep.CapacityRemainingMemory**  
**(Alternative Use)**

<b>Description</b>	Remaining amount of memory in MiB available for this Diego Cell to allocate to containers.
	<p><b>Use:</b> Can indicate low memory capacity overall in the platform. Low memory can prevent app scaling and new deployments. The overall sum of capacity can indicate that you need to scale the platform. Observing capacity consumption trends over time helps with capacity planning.</p>
	<p><b>Origin:</b> Firehose  <b>Type:</b> Gauge (Integer in MiB)  <b>Frequency:</b> 60 s</p>
<b>Recommended measurement</b>	Minimum over the last 5 minutes divided by 1024 (across all instances)
<b>Recommended alert thresholds</b>	<p><b>Yellow warning:</b> ≤ 64 GB  <b>Red critical:</b> ≤ 32 GB</p>
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Assign more resources to the Diego Cells or assign more Diego Cells.</li> <li>2. Scale additional Diego Cells using Tanzu Operations Manager.</li> </ol>
<b>Alternative Metric</b>	If you are using Healthwatch, VMware recommends the metric <code>healthwatch.Diego.AvailableFreeChunks</code> for this purpose. For more information, see <a href="#">Healthwatch Metrics</a> in the Healthwatch documentation.

## Remaining disk available — Diego Cell disk chunks available

**rep.CapacityRemainingDisk**

<b>Description</b>	Remaining amount of disk in MiB available for this Diego Cell to allocate to containers.
	<p><b>Use:</b> Indicates the available Diego Cell disk. Insufficient free disk on Diego Cells prevents the staging or starting of apps or tasks, resulting in error messages like <code>ERR Failed to stage app: insufficient resources</code>.</p> <p>Because Diego fails to stage without at least 6 GB free, unreserved disk space on a given Diego Cell, the strongest operational value of this metric is to ensure that at least some Diego Cells have a large enough disk capacity to support the staging of apps and tasks.</p> <p>VMware recommends computing and monitoring for the number of Diego Cells with at least 6 GB Disk free. When the number of Diego Cells with at least 6 GB falls below a defined threshold, this is a scaling indicator alert to increase capacity. The alerting threshold value for the amount of <i>free chunks</i> of Disk should be tuned to the deployment size and the standard size of apps being pushed to the deployment.</p>
	<p><b>Origin:</b> Firehose  <b>Type:</b> Gauge (Integer in MiB)  <b>Frequency:</b> 60 s</p>

**rep.CapacityRemainingDisk**

<b>Recommended measurement</b>	<p><b>For alerting:</b></p> <ol style="list-style-type: none"> <li>Because Diego fails to stage without at least 6 GB free, this is the suggested minimum value to calculate <i>free chunks</i> of Remaining Disk by.</li> <li>Create a script/tool that can iterate through each Diego Cell and do the following:           <ol style="list-style-type: none"> <li>Pull the <code>rep.CapacityRemainingDisk</code> metric for each Diego Cell.</li> <li>Divide the values received by 1000 to get the value in GB (threshold is GB-based).</li> <li>Compare recorded values to your minimum capacity threshold, and count the number of Diego Cells that have equal or greater than the desired amount of <i>free chunk</i> space.</li> <li>Determine a desired scaling threshold based on the minimum amount of <i>free chunks</i> that are acceptable in this deployment given historical trends.</li> <li>Set an alert to indicate the need to scale Diego Cell disk capacity when the value falls below the desired threshold number.</li> </ol> </li> </ol> <p><b>For visualization purposes:</b></p> <p>Looking at this metric (<code>rep.CapacityRemainingDisk</code>) as a minimum value per Diego Cell has more informational value than alerting value. It can be an interesting heatmap visualization, showing average variance and density over time.</p>
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>Assign more resources to the Diego Cells or assign more Diego Cells.</li> <li>Scale additional Diego Cells using Tanzu Operations Manager.</li> </ol>
<b>Alternative Metric</b>	If you are using Healthwatch, VMware recommends the metric <code>healthwatch.Diego.AvailableFreeChunks</code> for this purpose. For more information, see <a href="#">Healthwatch Metrics</a> in the Healthwatch documentation.

**Remaining disk available - Overall remaining disk available****rep.CapacityRemainingDisk  
(Alternative Use)**

<b>Description</b>	Remaining amount of disk in MiB available for this Diego Cell to allocate to containers.
<b>Use:</b>	Low disk capacity can prevent app scaling and new deployments. Because Diego staging Tasks can fail without at least 6 GB free, the red threshold VMware recommends is based on the minimum disk capacity across the deployment falling below 6 GB in the previous 5 minutes.
	It can also be advantageous to assess how many chunks of free disk space are higher than a given threshold, similar to <code>rep.CapacityRemainingMemory</code> .
<b>Origin:</b>	Firehose

**Type:** Gauge (Integer in MiB)**Frequency:** 60 s

**rep.CapacityRemainingDisk  
(Alternative Use)**

<b>Recommended measurement</b>	Minimum over the last 5 minutes divided by 1024 (across all instances)
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> ≤ 12 GB <b>Red critical:</b> ≤ 6 GB
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Assign more resources to the Diego Cells or assign more Diego Cells.</li> <li>2. Scale additional Diego Cells using Tanzu Operations Manager.</li> </ol>
<b>Alternative Metric</b>	If you are using Healthwatch, VMware recommends the metric <code>healthwatch.Diego.AvailableFreeChunks</code> for this purpose. For more information, see <a href="#">Healthwatch Metrics</a> in the Healthwatch documentation.

## Diego Cell rep time to sync

**rep.RepBulkSyncDuration**

<b>Description</b>	Time in ns that the Diego Cell Rep took to sync the ActualLRPs that it claimed with its actual Garden containers.
<b>Use:</b>	Sync times that are too high can indicate issues with the BBS.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float in ns)
<b>Frequency:</b>	30 s
<b>Recommended measurement</b>	Maximum over the last 15 minutes divided by 1,000,000,000
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> ≥ 5 s <b>Red critical:</b> ≥ 10 s
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Investigate BBS logs for faults and errors.</li> <li>2. If a particular Diego Cell or Diego Cells appear problematic, pull logs for the Diego Cells and the BBS logs before contacting Support.</li> </ol>

## Garden health check failed

**rep.GardenHealthCheckFailed**

<b>Description</b>	The Diego Cell periodically checks its health against the Garden back end. For Diego Cells, <code>0</code> means healthy, and <code>1</code> means unhealthy.
<b>Use:</b>	Set an alert for further investigation if multiple unhealthy Diego Cells are detected in the given time window. If one Diego Cell is impacted, it does not participate in auctions, but end-user impact is usually low. If multiple Diego Cells are impacted, this can indicate a larger problem with Diego, and should be considered a more critical investigation need.
<b>Suggested alert threshold:</b>	Suggested alert threshold based on multiple unhealthy Diego Cells in the given time window.
<b>Notes:</b>	Although end-user impact is usually low if only one Diego Cell is impacted, this should still be investigated. Particularly in a lower capacity environment, this situation can result in negative end-user impact if left unresolved.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float, 0-1)
<b>Frequency:</b>	30 s
<b>Recommended measurement</b>	Maximum over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> = 1 <b>Red critical:</b> > 1
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Investigate Diego Cell servers for faults and errors.</li> <li>2. If a particular Diego Cell or Diego Cells appear problematic:           <ol style="list-style-type: none"> <li>1. Determine a time interval during which the metrics from the Diego Cell changed from healthy to unhealthy.</li> <li>2. Pull the logs that the Diego Cell generated over that interval. The Diego Cell ID is the same as the BOSH instance ID.</li> <li>3. Pull the BBS logs over that same time interval.</li> <li>4. Contact Support.</li> </ol> </li> <li>3. As a last resort, if you cannot wait for Support, it sometimes helps to recreate the Diego Cell by running <code>bosh recreate</code>. For information about the <code>bosh recreate</code> command syntax, see <a href="#">Deployments</a> in <a href="#">Commands</a> in the BOSH documentation. Recreating a Diego Cell destroys its logs. To activate a root cause analysis of the Diego Cell's problem, save out its logs before running <code>bosh recreate</code>.</li> </ol>

## Diego Locket metrics

These sections describe Diego Locket metrics.

### Locks held by BBS

**bbs.LockHeld**

<b>Description</b>	Whether a BBS instance holds the expected BBS lock (in Locket). 1 means the active BBS server holds the lock, and 0 means the lock was lost.
<b>Use:</b>	This metric is complimentary to <a href="#">Active Locks</a> , and it offers a BBS-level version of the Locket metrics. Although it is emitted per BBS instance, only 1 active lock is held by BBS. Therefore, the expected value is 1. The metric might be 0 when the BBS instances are performing a leader transition, but a prolonged value of 0 indicates an issue with BBS.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge
<b>Frequency:</b>	Periodically
<b>Recommended measurement</b>	Maximum over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> N/A <b>Red critical:</b> ≠ 1
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>Run <code>monit status</code> on the Diego database VM to check for failing processes.</li> <li>If there are no failing processes, then review the logs for BBS. <ul style="list-style-type: none"> <li>A healthy BBS shows obvious activity around starting or claiming LRPs.</li> <li>An unhealthy BBS leads to the Auctioneer showing minimal or no activity. The BBS sends work to the Auctioneer.</li> </ul> </li> <li>If you are unable to resolve the issue, pull logs from the Diego BBS, which include the Locket service component logs, and contact Support.</li> </ol>

**Locks held by auctioneer****auctioneer.LockHeld**

<b>Description</b>	Whether an Auctioneer instance holds the expected Auctioneer lock (in Locket). 1 means the active Auctioneer holds the lock, and 0 means the lock was lost.
<b>Use:</b>	This metric is complimentary to <a href="#">Active Locks</a> , and it offers an Auctioneer-level version of the Locket metrics. Although it is emitted per Auctioneer instance, only 1 active lock is held by Auctioneer. Therefore, the expected value is 1. The metric might be 0 when the Auctioneer instances are performing a leader transition, but a prolonged value of 0 indicates an issue with Auctioneer.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge
<b>Frequency:</b>	Periodically
<b>Recommended measurement</b>	Maximum over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> N/A <b>Red critical:</b> ≠ 1

**auctioneer.LockHeld****Recommended response**

1. Run `monit status` on the Diego Database VM to check for failing processes.
2. If there are no failing processes, then review the logs for Auctioneer.
  - o Recent logs for Auctioneer should show all but one of its instances are currently waiting on locks, and the active Auctioneer should show a record of when it last attempted to run work. This attempt corresponds to app development activity, such as `cf push`.
3. If you are unable to resolve the issue, pull logs from the Diego BBS and Auctioneer VMs, which includes the Locket service component logs, and contact Support.

## Active presences

**locket.ActivePresences**

**Description** Total count of active presences. Presences are defined as the registration records that the Diego Cells maintain to advertise themselves to the platform.

**Use:** If the Active Presences count is far from the expected, there might be a problem with Diego.

The number of active presences varies according to the number of Diego Cells deployed. Therefore, during purposeful scale adjustments to TAS for VMs, this alerting threshold should be adjusted.

Establish an initial threshold by observing the historical trends for the deployment over a brief period of time. Increase the threshold as more Diego Cells are deployed. During a rolling deploy, this metric shows variance during the BOSH lifecycle when Diego Cells are evacuated and restarted. Tolerable variance is within the bounds of the BOSH maximum in-flight range for the instance group.

**Origin:** Firehose

**Type:** Gauge

**Frequency:** 60 s

**Recommended measurement** Maximum over the last 15 minutes

**Recommended alert thresholds** **Yellow warning:** Dynamic  
**Red critical:** Dynamic

**Recommended response**

1. Ensure that the variance is not the result of an active rolling deploy. Also ensure that the alert threshold is appropriate to the number of Diego Cells in the current deployment.
2. Run `monit status` to inspect for failing processes.
3. If there are no failing processes, then review the logs for the components using the Locket service itself on Diego BBS instances.
4. If you are unable to resolve the problem, pull the logs from the Diego BBS, which include the Locket service component logs, and contact Support.

# Diego Route Emitter metrics

These sections describe Diego Route Emitter metrics.

## Route Emitter time to sync

### route\_emitter.RouteEmitterSyncDuration

<b>Description</b>	Time in ns that the active Route Emitter took to perform its synchronization pass.
<b>Use:</b>	Increases in this metric indicate that the Route Emitter might have trouble maintaining an accurate routing table to broadcast to the Gorouters. Tune alerting values to your deployment based on historical data and adjust based on observations over time. The suggested starting point is $\geq 5$ for the yellow threshold and $\geq 10$ for the critical threshold.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float in ns)
<b>Frequency:</b>	60 s
<b>Recommended measurement</b>	Maximum, per job, over the last 15 minutes divided by 1,000,000,000
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	If all or many jobs showing as impacted, there is likely an issue with Diego. <ol style="list-style-type: none"> <li>Investigate the Route Emitter and Diego BBS logs for errors.</li> <li>Verify that app routes are functional by making a request to an app, pushing an app and pinging it, or if applicable, checking that your smoke tests have passed.</li> </ol> If one or a few jobs showing as impacted, there is likely a connectivity issue and the impacted job should be investigated further.

## TAS for VMs MySQL KPIs

These sections describe TAS for VMs MySQL KPIs.

When TAS for VMs uses an internal MySQL database, as configured in the **Databases** pane of the TAS for VMs tile, the database cluster generates KPIs as described here.

This section assumes you are using the **Internal Databases - MySQL - Percona XtraDB Cluster** option as your system database.

## Server availability

**/mysql/available**

<b>Description</b>	If the MySQL Server is responding to requests. This indicates if the component is available.
<b>Use:</b>	If the server does not emit heartbeats, it is offline.
<b>Origin:</b>	Doppler/Firehose
<b>Type:</b>	Boolean
<b>Frequency:</b>	30 s
<b>Recommended measurement</b>	Average over last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> N/A <b>Red critical:</b> < 1
<b>Recommended response</b>	Check the MySQL Server logs for errors. You can find the instance by targeting your MySQL deployment with BOSH and inspecting logs for the instance. For more information, see <a href="#">Failing Jobs and Unhealthy Instances</a> .  If your service plan is an highly available (HA) cluster, you can also run <code>mysql-diag</code> to check logs for errors.

## Persistent Disk Used

**/mysql/system/persistent\_disk\_used\_percent**

<b>Description</b>	The percentage of disk used on the persistent file system.
<b>Use:</b>	MySQL cannot function correctly if there is not sufficient free space on the file systems. Use these metrics to ensure that you have disks large enough for your user base.
<b>Origin:</b>	Doppler/Firehose
<b>Type:</b>	Percent
<b>Frequency:</b>	30 s (default)
<b>Recommended measurement</b>	Maximum of persistent disk used of all of nodes
<b>Recommended alert thresholds</b>	<b>Single Node and Leader Follower:</b> <ul style="list-style-type: none"> <li><b>Yellow warning:</b> &gt; 25%</li> <li><b>Red critical:</b> &gt; 30%</li> </ul> <b>Highly Available Cluster:</b> <ul style="list-style-type: none"> <li><b>Yellow warning:</b> &gt; 80%</li> <li><b>Red critical:</b> &gt; 90%</li> </ul>
<b>Recommended response</b>	Upgrade the service instance to a plan with larger disk capacity.  For Tanzu SQL for VMs v2.9 and later, if you set the <code>optimize_for_short_words</code> parameter to <code>true</code> , then see <a href="#">Troubleshooting VMware Tanzu SQL with MySQL for VMs</a> before upgrading the service.

## Ephemeral Disk Used

### /mysql/system/ephemeral\_disk\_used\_percent

<b>Description</b>	The percentage of disk used on the ephemeral file system.
	<p><b>Use:</b> MySQL cannot function correctly if there is not sufficient free space on the file systems. Use these metrics to ensure that you have disks large enough for your user base.</p>
	<p><b>Origin:</b> Doppler/Firehose  <b>Type:</b> Percent  <b>Frequency:</b> 30 s (default)</p>
<b>Recommended measurement</b>	Maximum disk used of all nodes
<b>Recommended alert thresholds</b>	<p><b>Yellow warning:</b> &gt; 80%  <b>Red critical:</b> &gt; 95%</p>
<b>Recommended response</b>	Upgrade the service instance to a plan with larger disk capacity.

## CPU use percentage

### /mysql/performance/cpu\_utilization\_percent

<b>Description</b>	CPU time being consumed by the MySQL service.
	<p><b>Use:</b> A node that experiences context switching or high CPU use becomes unresponsive. This also affects the ability of the node to report metrics.</p>
	<p><b>Origin:</b> Doppler/Firehose  <b>Type:</b> Percent  <b>Frequency:</b> 30 s (default)</p>
<b>Recommended measurement</b>	Average over last 10 minutes
<b>Recommended alert thresholds</b>	<p><b>Yellow warning:</b> &gt; 80 <b>Red critical:</b> &gt; 90</p>
<b>Recommended response</b>	Discover what is using so much CPU. If it is from normal processes, update the service instance to use a plan with larger CPU capacity.

## Connections

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**/mysql/variables/max\_connections**

**/p.mysql/net/max\_used\_connections**

<b>Description</b>	The maximum number of connections used over the maximum permitted number of simultaneous client connections.
	<p><b>Use:</b> If the number of connections drastically changes or if apps are unable to connect, there might be a network or app issue.</p> <p><b>Origin:</b> Doppler/Firehose  <b>Type:</b> count  <b>Frequency:</b> 30 s</p>
<b>Recommended measurement</b>	<code>max_used_connections / max_connections</code>
<b>Recommended alert thresholds</b>	<p><b>Yellow warning:</b> &gt; 80 %</p> <p><b>Red critical:</b> &gt; 90 %</p>
<b>Recommended response</b>	<p>If this measurement meets or exceeds 80% with exponential growth, monitor app use to ensure that everything is working.</p> <p>When approaching 100% of maximum connections, apps might not always connect to the database. The connections/second for a service instance vary based on app instances and app use.</p>

## Queries Delta

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**/mysql/performance/queries\_delta**

<b>Description</b>	The number of statements executed by the server over the last 30 seconds.
	<p><b>Use:</b> The server always processes queries. If the server does not process queries, the server is non-functional.</p> <p><b>Origin:</b> Doppler/Firehose  <b>Type:</b> count  <b>Frequency:</b> 30 s</p>
<b>Recommended measurement</b>	Average over last 2 minutes
<b>Recommended alert thresholds</b>	<b>Red critical:</b> 0
<b>Recommended response</b>	Investigate the MySQL server logs, such as the audit log, to understand why query rate changed and decide on appropriate action.

## Highly Available Cluster WSREP Ready

### /mysql/galera/wsrep\_ready

<b>Description</b>	Shows whether each cluster node can accept queries. Returns only 0 or 1. When this metric is 0, almost all queries to that node fail with the error: <code>ERROR 1047 (08501) Unknown Command</code>
<b>Use:</b> Discover when nodes of a cluster were unable to communicate and accept transactions.	
<b>Origin:</b> Doppler/Firehose	
<b>Type:</b> Boolean	
<b>Frequency:</b> 30 s (default)	
<b>Recommended measurement</b>	Average of values of each cluster node, over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> < 1 <b>Red critical:</b> 0 (cluster is down)
<b>Recommended response</b>	<ul style="list-style-type: none"> <li>Run <code>mysql-diag</code> and check the MySQL Server logs for errors.</li> <li>Ensure that no infrastructure event is affecting intra-cluster communication.</li> <li>Ensure that <code>wsrep_ready</code> is not set to off by using the query: <code>SHOW STATUS LIKE 'wsrep_ready';</code></li> </ul>

## Highly Available Cluster WSREP Cluster Size

### /mysql/galera/wsrep\_cluster\_size

<b>Description</b>	The number of cluster nodes with which each node is communicating normally.
<b>Use:</b> When running in a multi-node configuration, this metric indicates if each member of the cluster is communicating normally with all other nodes.	
<b>Origin:</b> Doppler/Firehose	
<b>Type:</b> count	
<b>Frequency:</b> 30 s (default)	
<b>Recommended measurement</b>	(Average of the values of each node / cluster size), over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> < 3 (availability compromised) <b>Red critical:</b> < 1 (cluster unavailable)
<b>Recommended response</b>	Run <code>mysql-diag</code> and check the MySQL Server logs for errors.

## Highly Available Cluster WSREP Cluster Status

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### **/mysql/galera/wsrep\_cluster\_status**

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<b>Description</b>	Shows the primary status of the cluster component that the node is in. Values are:
	<ul style="list-style-type: none"> <li>• <code>Primary</code>: Node has a quorum.</li> <li>• <code>Non-primary</code>: Node has lost a quorum.</li> <li>• <code>Disconnected</code>: Node is unable to connect to other nodes.</li> </ul>
	<b>Use:</b> Any value other than <code>primary</code> indicates that the node is part of a non-operational component. This occurs in cases of multiple membership changes that cause a loss of quorum.
	<b>Origin:</b> Doppler/Firehose <b>Type:</b> integer (see above) <b>Frequency:</b> 30 s (default)
<b>Recommended measurement</b>	Sum of each of the nodes, over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> < 3 <b>Red critical:</b> < 1
<b>Recommended response</b>	<ul style="list-style-type: none"> <li>• Verify that all nodes are in working order and can receive write-sets</li> <li>• Run <code>mysql-diag</code> and check the MySQL Server logs for errors</li> </ul>

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## Gorouter metrics

These sections describe Gorouter metrics.

### Router file descriptors

## **gorouter.file\_descriptors**

<b>Description</b>	The number of file descriptors currently used by the Gorouter job.
	<p><b>Use:</b> Indicates an impending issue with the Gorouter. Without proper mitigation, it is possible for an unresponsive app to eventually exhaust available Gorouter file descriptors and cause route starvation for other apps running on TAS for VMs. Under heavy load, this unmitigated situation can also result in the Gorouter losing its connection to NATS and all routes being pruned.</p> <p>While a drop in <code>gorouter.total_routes</code> or an increase in <code>gorouter.ms_since_last_registry_update</code> helps to surface that the issue might already be occurring, alerting on <code>gorouter.file_descriptors</code> indicates that such an issue is impending.</p> <p>The Gorouter limits the number of file descriptors to 100,000 per job. Once the limit is met, the Gorouter is unable to establish any new connections.</p> <p>To reduce the risk of DDoS attacks, VMware recommends doing one or both of the following:</p> <ul style="list-style-type: none"> <li>Within TAS for VMs, set <b>Maximum connections per back end</b> to define how many requests can be routed to each Gorouter app instance. This prevents a single app from using all Gorouter connections. The value specified should be determined by the operator based on the use cases for that foundation. A value of 0 sets no limit. The default number is 500.</li> <li>Add rate limiting at the load balancer level.</li> </ul> <p><b>Origin:</b> Firehose  <b>Type:</b> Gauge  <b>Frequency:</b> 5 s</p>
<b>Recommended measurement</b>	Maximum, per Gorouter job, over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> 50,000 per job <b>Red critical:</b> 60,000 per job
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>Identify which app(s) are requesting excessive connections and resolve the impacting issues with these apps.</li> <li>If the mitigation steps have not already been taken, do so.</li> <li>Consider adding more Gorouter VM resources to increase the number of available file descriptors.</li> </ol>

## Router exhausted connections

### **gorouter.backend\_exhausted\_conns**

<b>Description</b>	The lifetime number of requests that have been rejected by the Gorouter VM due to the <code>Max Connections Per Backend</code> limit being reached across all tried back ends. The limit controls the number of concurrent TCP connections to any particular app instance and is configured within TAS for VMs.
<b>Use:</b>	Indicates that TAS for VMs is mitigating risk to other apps by self-protecting the platform against one or more unresponsive apps. Increases in this metric indicate the need to investigate and resolve issues with potentially unresponsive apps. A rapid rate of change upward is concerning and should be assessed further.
<b>Origin:</b>	Firehose
<b>Type:</b>	Counter (Integer)
<b>Frequency:</b>	5 s
<b>Recommended measurement</b>	Maximum delta per minute, per Gorouter job, over a 5-minute window
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. If <code>gorouter.backend_exhausted_conns</code> spikes, first look to the Router Throughput metric <code>gorouter.total_requests</code> to determine if this measure is high or low in relation to normal bounds for this deployment.</li> <li>2. If Router Throughput appears within normal bounds, it is likely that <code>gorouter.backend_exhausted_conns</code> is spiking due to an unresponsive app, possibly due to app code issues or underlying app dependency issues. To help determine the problematic app, look in access logs for repeated calls to one app. Then proceed to troubleshoot this app accordingly.</li> <li>3. If Router Throughput also shows unusual spikes, the cause of the increase in <code>gorouter.backend_exhausted_conns</code> spikes is likely external to the platform. Unusual increases in load can be due to expected business events driving additional traffic to apps. Unexpected increases in load can indicate a DDoS attack risk.</li> </ol>

## Router throughput

**gorouter.total\_requests**

<b>Description</b>	The lifetime number of requests completed by the Gorouter VM, emitted per Gorouter instance
<b>Use:</b>	The aggregation of these values across all Gorouters provide insight into the overall traffic flow of a deployment. Unusually high spikes, if not known to be associated with an expected increase in demand, can indicate a DDoS risk. For performance and capacity management, consider this metric a measure of router throughput per job, converting it to requests-per-second, by looking at the delta value of <code>gorouter.total_requests</code> and deriving back to 1s, or <code>gorouter.total_requests.delta / 5</code> , per Gorouter instance. This helps you see trends in the throughput rate that indicate a need to scale the Gorouter instances. Use the trends you observe to tune the threshold alerts for this metric.
<b>Origin:</b>	Firehose
<b>Type:</b>	Counter (Integer)
<b>Frequency:</b>	5 s
<b>Recommended measurement</b>	Average over the last 5 minutes of the derived per second calculation
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	For optimizing the Gorouter, consider the requests-per-second derived metric in the context of router latency and Gorouter VM CPU utilization. From performance and load testing of the Gorouter, VMware has observed that at approximately 2500 simple requests per second, latency can begin to increase. This number changes based on your traffic profile and VM capabilities.  To increase throughput and maintain low latency, scale the Gorouters either horizontally or vertically and ensure that the <code>system.cpu.user</code> metric for the Gorouter stays in the suggested range of 60-70% CPU Utilization. For more information about the <code>system.cpu.user</code> metric, see <a href="#">VM CPU Utilization</a> .

## Router handling latency

**gorouter.latency**

<b>Description</b>	The time in milliseconds that represents the length of a request from the Gorouter's point of view. This timing starts when Gorouter receives a request and stops when Gorouter finishes processing the response from the app. Long uploads, downloads, or app responses increase this time. This metric includes the request time to all back end endpoints, including both apps and routable system components like Cloud Controller and UAA.
<b>Use:</b>	Indicates the traffic profile of TAS for VMs. An alert value on this metric should be tuned to the specifics of the deployment and its underlying network considerations; a suggested starting point is 100 ms.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float in ms)
<b>Frequency:</b>	Emitted per Gorouter request, emission should be constant on a running deployment

**gorouter.latency**

<b>Recommended measurement</b>	Average over the last 30 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	<p>Extended periods of high latency can point to several factors. The Gorouter latency measure includes network and back end latency impacts as well.</p> <ol style="list-style-type: none"> <li>1. First inspect logs for network issues and indications of misbehaving back ends.</li> <li>2. If it appears that the Gorouter needs to scale due to ongoing traffic congestion, do not scale on the latency metric alone. You should also look at the CPU utilization of the Gorouter VMs and keep it within a maximum 60-70% range.</li> <li>3. Resolve high utilization by scaling the Gorouter.</li> <li>4. Follow steps in the doc <a href="#">Troubleshooting Slow Requests in CF</a>.</li> </ol>

**Time since last route register received****gorouter.ms\_since\_last\_registry\_update**

<b>Description</b>	Time in milliseconds since the last route register was received, emitted per Gorouter instance
<b>Use:</b>	Indicates if routes are not being registered to apps correctly.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float in ms)
<b>Frequency:</b>	30 s
<b>Recommended measurement</b>	Maximum over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> N/A <b>Red critical:</b> > 30,000 This threshold is suitable for normal platform usage. It alerts if it has been at least 30 seconds since the Gorouter last received a message from an app.
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Search the Gorouter and Route Emitter logs for connection issues to NATS.</li> <li>2. Check the BOSH logs to see if the NATS, Gorouter, or Route Emitter VMs are failing.</li> <li>3. Look more broadly at the health of all VMs, particularly Diego-related VMs.</li> <li>4. If problems persist, pull the Gorouter and Route Emitter logs and contact Support to say there are consistently long delays in route registry.</li> </ol>

**Router Error: 502 bad gateway**

**gorouter.bad\_gateways**

<b>Description</b>	The lifetime number of bad gateways, or 502 responses, from the Gorouter itself, emitted per Gorouter instance.  The Gorouter emits a 502 bad gateway error when it has a route in the routing table and, in attempting to make a connection to the back end, finds that the back end does not exist.
	<b>Use:</b> Indicates that route tables might be stale. Stale routing tables suggest an issue in the route register management plane, which indicates that something has likely changed with the locations of the containers. Always investigate unexpected increases in this metric.
	<b>Origin:</b> Firehose <b>Type:</b> Count (Integer, Lifetime) <b>Frequency:</b> 5 s
<b>Recommended measurement</b>	Maximum delta per minute over a 5-minute window

<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Check the Gorouter and Route Emitter logs to see if they are experiencing issues when connecting to NATS.</li> <li>2. Check the BOSH logs to see if the NATS, Gorouter, or Route Emitter VMs are failing.</li> <li>3. Look broadly at the health of all VMs, particularly Diego-related VMs.</li> <li>4. If problems persist, pull Gorouter and Route Emitter logs and contact Support to say there has been an unusual increase in Gorouter bad gateway responses.</li> </ol>

**Router Error: server error****gorouter.responses.5xx**

<b>Description</b>	The lifetime number of requests completed by the Gorouter VM for HTTP status family 5xx, server errors, emitted per Gorouter instance.
	<b>Use:</b> A repeatedly crashing app is often the cause of a big increase in 5xx responses. However, response issues from apps can also cause an increase in 5xx responses. Always investigate an unexpected increase in this metric.
	<b>Origin:</b> Firehose <b>Type:</b> Counter (Integer) <b>Frequency:</b> 5 s
<b>Recommended measurement</b>	Maximum delta per minute over a 5-minute window

<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
-------------------------------------	----------------------------------------------------------------

**gorouter.responses.5xx****Recommended response**

1. Look for out-of-memory errors and other app-level errors.
2. As a temporary measure, ensure that the troublesome app is scaled to more than one instance.

## Number of Gorouter routes registered

**gorouter.total\_routes**

<b>Description</b>	The current total number of routes registered with the Gorouter, emitted per Gorouter instance
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**Use:** The aggregation of these values across all Gorouters indicates uptake and gives a picture of the overall growth of the environment for capacity planning.

VMware also recommends alerting on this metric if the number of routes falls outside of the normal range for your deployment. Dramatic decreases in this metric volume can indicate a problem with the route registration process, such as an app outage, or that something in the route register management plane has failed.

If visualizing these metrics on a dashboard, `gorouter.total_routes` can be helpful for visualizing dramatic drops. However, for alerting purposes, the `gorouter.ms_since_last_registry_update` metric is more valuable for quicker identification of Gorouter issues. Alerting thresholds for `gorouter.total_routes` should focus on dramatic increases or decreases out of expected range.

**Origin:** Firehose

**Type:** Gauge (Float)

**Frequency:** 30 s

<b>Recommended measurement</b>	5-minute average of the per second delta
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<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
-------------------------------------	----------------------------------------------------------------

**Recommended response**

1. For capacity needs, scale up or down the Gorouter VMs as necessary.
2. For significant drops in current total routes, see the `gorouter.ms_since_last_registry_update` metric for additional context. For more information, see [Time Since Last Route Register Received](#).
3. Check the Gorouter and Route Emitter logs to see if they are experiencing issues when connecting to NATS.
4. Check the BOSH logs to see if the NATS, Gorouter, or Route Emitter VMs are failing.
5. Look broadly at the health of all VMs, particularly Diego-related VMs.
6. If problems persist, pull the Gorouter and Route Emitter logs and contact Support.

## UAA metrics

## UAA throughput

### **uaa.requests.global.completed.count**

<b>Description</b>	The lifetime number of requests completed by the UAA VM, emitted per UAA instance. This number includes health checks.
<b>Use:</b>	For capacity planning purposes, the aggregation of these values across all UAA instances can provide insight into the overall load that UAA is processing. VMware recommends alerting on unexpected spikes per UAA instance. Unusually high spikes, if they are not associated with an expected increase in demand, might indicate a DDoS risk and should be investigated.
	For performance and capacity management, look at the UAA Throughput metric as either a requests-completed-per-second or requests-completed-per-minute rate to determine the throughput per UAA instance. This helps you see trends in the throughput rate that indicate a need to scale UAA instances. Use the trends you observe to tune the threshold alerts for this metric.
	From performance and load testing of UAA, VMware has observed that while UAA endpoints can have different throughput behavior, once throughput reaches its peak value per VM, it stays constant and latency increases.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Integer), emitted value increments over the lifetime of the VM like a counter
<b>Frequency:</b>	5 s
<b>Recommended measurement</b>	Average over the last 5 minutes of the derived requests-per-second or requests-per-minute rate, per instance
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	For optimizing UAA, consider this metric in the context of UAA request latency and UAA VM CPU utilization. To increase throughput and maintain low latency, scale the UAA VMs horizontally by editing the number of your <b>UAA</b> VM instances in the <b>Resource Config</b> pane of the TAS for VMs tile and ensure that the <code>system.cpu.user</code> metric for UAA is not sustained in the suggested range of 80-90% maximum CPU utilization. For more information, see <a href="#">UAA Request Latency</a> and <a href="#">UAA VM CPU Utilization</a> in <i>Key Capacity Scaling Indicators</i> .

## UAA request latency

**gorouter.latency.uaa**

<b>Description</b>	Time in milliseconds that UAA took to process a request that the Gorouter sent to UAA endpoints.
	<p><b>Use:</b> Indicates how responsive UAA has been to requests sent from the Gorouter. Some operations might take longer to process, such as creating bulk users and groups. It is important to correlate latency observed with the endpoint and evaluate this data in the context of overall historical latency from that endpoint. Unusual spikes in latency can indicate the need to scale UAA VMs.</p> <p>This metric is emitted only for the routers serving the UAA system component and is not emitted per isolation segment even if you are using isolated routers.</p> <p><b>Origin:</b> Firehose  <b>Type:</b> Gauge (Float in ms)  <b>Frequency:</b> Emitted per Gorouter request to UAA</p>
<b>Recommended measurement</b>	Maximum, per job, over the last 5 minutes
<b>Recommended alert thresholds</b>	<p><b>Yellow warning:</b> Dynamic</p> <p><b>Red critical:</b> Dynamic</p>
<b>Recommended response</b>	<p>Latency depends on the endpoint and operation being used. It is important to correlate the latency with the endpoint and evaluate this data in the context of the historical latency from that endpoint.</p> <ol style="list-style-type: none"> <li>1. Inspect which endpoints requests are hitting. Use historical data to determine if the latency is unusual for that endpoint. For a list of UAA endpoints, see the <a href="#">UAA API documentation</a>.</li> <li>2. If it appears that UAA needs to be scaled due to ongoing traffic congestion, do not scale based on the latency metric alone. You should also ensure that the <code>system.cpu.user</code> metric for UAA stays in the suggested range of 80-90% maximum CPU utilization.</li> <li>3. Resolve high utilization by scaling UAA VMs horizontally. To scale UAA, navigate to the <b>Resource Config</b> pane of the TAS for VMs tile and edit the number of your <b>UAA</b> VM instances.</li> </ol>

## UAA requests in flight

**uaa.server.inflight.count**

<b>Description</b>	The number of requests UAA is currently processing (in-flight requests), emitted per UAA instance.
<b>Use:</b>	Indicates how many concurrent requests are currently in flight for the UAA instance. Unusually high spikes, if they are not associated with an expected increase in demand, might indicate a DDoS risk.
	From performance and load testing of the UAA component, VMware has observed that the number of concurrent requests impacts throughput and latency. The UAA Requests In Flight metric helps you see trends in the request rate that can indicate the need to scale UAA instances. Use the trends you observe to tune the threshold alerts for this metric.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Integer)
<b>Frequency:</b>	5 s
<b>Recommended measurement</b>	Maximum, per job, over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> Dynamic <b>Red critical:</b> Dynamic
<b>Recommended response</b>	To increase throughput and maintain low latency when the number of in-flight requests is high, scale UAA VMs horizontally by editing the <b>UAA</b> VM field in the <b>Resource Config</b> pane of the TAS for VMs tile. Ensure that the <code>system.cpu.user</code> metric for UAA is not sustained in the suggested range of 80-90% maximum CPU utilization.

## System (BOSH) metrics

These sections describe system metrics, or BOSH metrics.

BOSH system metrics appear in the Firehose in two different formats. The tables in the following section list both formats.

### Virtual Machine (VM) health

**system.healthy**  
**system\_healthy**

<b>Description</b>	<code>1</code> means the system is healthy, and <code>0</code> means the system is not healthy.
<b>Use:</b>	This is the most important BOSH metric to monitor. It indicates if the VM emitting the metric is healthy. Review this metric for all VMs to estimate the overall health of the system.
	Multiple unhealthy VMs signals problems with the underlying IaaS layer.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (Float, 0-1)
<b>Frequency:</b>	60 s

**system.healthy**  
**system\_healthy**

<b>Recommended measurement</b>	Average over the last 5 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> N/A <b>Red critical:</b> < 1
<b>Recommended response</b>	Investigate TAS for VMs logs for the unhealthy components.

## VM disk used

**system.disk.system.percent**  
**system\_disk\_system\_percent**

<b>Description</b>	System disk — Percentage of the system disk used on the VM
<b>Use:</b> Set an alert to indicate when the system disk is almost full.	
<b>Origin:</b> Firehose <b>Type:</b> Gauge (%) <b>Frequency:</b> 60 s	
<b>Recommended measurement</b>	Average over the last 30 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> ≥ 80% <b>Red critical:</b> ≥ 90%
<b>Recommended response</b>	Investigate what is filling the jobs system partition. This partition should not typically fill because BOSH deploys jobs to use ephemeral and persistent disks.

## VM ephemeral disk used

**system.disk.ephemeral.percent**  
**system\_disk\_ephemeral\_percent**

<b>Description</b>	Ephemeral disk — Percentage of the ephemeral disk used on the VM
<b>Use:</b> Set an alert and investigate if the ephemeral disk usage is too high for a job over an extended period.	
<b>Origin:</b> Firehose <b>Type:</b> Gauge (%) <b>Frequency:</b> 60 s	
<b>Recommended measurement</b>	Average over the last 30 minutes

**system.disk.ephemeral.percent**  
**system\_disk\_ephemeral\_percent**

<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 80\%$ <b>Red critical:</b> $\geq 90\%$
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Run <code>bosh vms --details</code> to view jobs on affected deployments.</li> <li>2. Determine cause of the data consumption, and, if appropriate, increase disk space or scale out the affected jobs.</li> </ol>

## VM persistent disk used

**system.disk.persistent.percent**  
**system\_disk\_persistent\_percent**

<b>Description</b>	Persistent disk — Percentage of persistent disk used on the VM
<b>Use:</b>	Set an alert and investigate further if the persistent disk usage for a job is too high over an extended period.
<b>Origin:</b>	Firehose
<b>Type:</b>	Gauge (%)
<b>Frequency:</b>	60 s
<b>Recommended measurement</b>	Average over the last 30 minutes
<b>Recommended alert thresholds</b>	<b>Yellow warning:</b> $\geq 80\%$ <b>Red critical:</b> $\geq 90\%$
<b>Recommended response</b>	<ol style="list-style-type: none"> <li>1. Run <code>bosh vms --details</code> to view jobs on affected deployments.</li> <li>2. Determine cause of the data consumption, and, if appropriate, increase disk space or scale out affected jobs.</li> </ol>

## OpenTelemetry Collector metrics

This section describes key indicators for monitoring your system's ability to handle telemetry data and provide appropriate scaling guidance.

### Backpressure at drain destinations

**backpressure\_drain\_destinations**

<b>Description</b>	Backpressure reflects the difference between data ingested and the data successfully exported. It's a signal of congestion at the drain destinations where data may begin piling up.
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### backpressure\_drain\_destinations

<b>Recommended measurement</b>	<ul style="list-style-type: none"> <li>• <code>otelcol_exporter_queue_capacity</code> indicates the total queue capacity in batches of the sending queue.</li> <li>• <code>otelcol_exporter_queue_size</code> indicates the current size of the sending queue.</li> </ul> <p>Use these two metrics to check if the queue capacity can support your workload.</p>
	<p>To measure failed enqueues, track the following metrics:</p> <ul style="list-style-type: none"> <li>• <code>otelcol_exporter_enqueue_failed_spans</code></li> <li>• <code>otelcol_exporter_enqueue_failed_metric_points</code></li> <li>• <code>otelcol_exporter_enqueue_failed_log_records</code></li> </ul> <p>These metrics show how many spans, metrics, and logs failed to be enqueued into the pipeline when the queue was full.</p>
<b>Recommended alert thresholds</b>	Alert when a high proportion of <code>queue_size</code> to <code>queue_capacity</code> persists over a prolonged window.
<b>Recommended response</b>	<ul style="list-style-type: none"> <li>• Enable a retry mechanism to mitigate potential failures caused by backpressure in production deployments.</li> <li>• Consider horizontally scaling out affected jobs or decreasing the amount of telemetry generated by them.</li> <li>• If collector scaling does not resolve the issue, consider scaling the destination system.</li> </ul>

## Data Loss

### data\_loss

<b>Description</b>	Data loss indicates the amount of telemetry data (logs, metrics, spans) dropped at the VM level.
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<b>data_loss</b>	
<b>Recommended measurement</b>	<p>To compute the data drop rate, use the formula:</p> <pre>Data drop rate = 1 - (e/r)</pre> <p>Where:</p> <ul style="list-style-type: none"> <li><code>e</code>: Number of data points successfully exported.</li> <li><code>r</code>: Number of data points successfully received.</li> </ul> <p><b>Receiver metrics:</b></p> <ul style="list-style-type: none"> <li><code>otelcol_receiver_accepted_log_records</code></li> <li><code>otelcol_receiver_accepted_metric_points</code></li> <li><code>otelcol_receiver_accepted_spans</code></li> </ul> <p><b>Exporter metrics:</b></p> <ul style="list-style-type: none"> <li><code>otelcol_exporter_sent_log_records</code></li> <li><code>otelcol_exporter_sent_metric_points</code></li> <li><code>otelcol_exporter_sent_spans</code></li> </ul> <p>By comparing the number of data points ingested (<code>r</code>) to the number successfully exported (<code>e</code>), you can calculate the data loss percentage.</p> <ul style="list-style-type: none"> <li>If no data is dropped, <code>e = r</code>, and the data loss is 0.</li> <li>If all data is dropped, <code>e = 0</code>, and the data loss is 1.</li> </ul>
<hr/>	
<b>Recommended alert thresholds</b>	Set alert thresholds based on acceptable data loss for your project. Select a narrow time window before alerting begins to avoid notifications for small losses that are within the desired reliability range and not considered outages.
<hr/>	
<b>Recommended response</b>	<ul style="list-style-type: none"> <li>Check the CPU and memory consumption of the Collector in the affected VM.</li> <li>Scale vertically by increasing CPU or memory allocated to the Collector to handle the data volume.</li> </ul>

## Key capacity scaling indicators

VMware provides these indicators to operators as general guidance for capacity scaling. Each indicator is based on all platform metrics from all components.

This guidance is applicable to most TAS for VMs deployments. VMware recommends that operators fine-tune the suggested alert thresholds by observing historical trends for their deployments.

For more information about accessing metrics used in these key capacity scaling indicators, see [Overview of Logging and Metrics](#).

## Diego Cell capacity scaling indicators

There are three key capacity scaling indicators VMware recommends for a Diego Cell.

## Diego Cell memory capacity

<b>Description</b>	The Diego Cell Memory Capacity indicator is the percentage of remaining memory your Diego Cells can allocate to containers. Divide the <code>CapacityRemainingMemory</code> metric with the <code>CapacityTotalMemory</code> to get this percentage. The metric <code>CapacityRemainingMemory</code> is the remaining memory, in MiB, available to a Diego Cell. The metric <code>CapacityTotalMemory</code> is the total memory, in MiB, available to a Diego Cell.
<b>Source ID</b>	<code>rep</code>
<b>Metrics</b>	<code>CapacityRemainingMemory</code> <code>CapacityTotalMemory</code>
<b>Recommended thresholds</b>	< average (35%) This threshold assumes you have three AZs.
<b>How to scale</b>	Deploy additional diego cells until the average free memory is 35%. This threshold assumes you have three AZs.
<b>Additional details</b>	<b>Type:</b> Gauge (%) <b>Frequency:</b> Emitted every 60 s <b>Applies to:</b> cf:diego_cells

## Diego Cell disk capacity

<b>Description</b>	The Diego Cell Disk Capacity indicator is the percentage of remaining disk capacity a given Diego Cell can allocate to containers. Divide the <code>CapacityRemainingDisk</code> metric by the <code>CapacityTotalDisk</code> metric to get this percentage. The metric <code>CapacityRemainingDisk</code> is the remaining amount of disk available, in MiB, for this Diego Cell. The metric <code>CapacityTotalDisk</code> indicates the total amount of disk available, in MiB, for this Diego Cell.
<b>Source ID</b>	<code>rep</code>
<b>Metrics</b>	<code>CapacityRemainingDisk</code> <code>CapacityTotalDisk</code>
<b>Recommended thresholds</b>	< average (35%) This threshold assumes you have three AZs.
<b>How to scale</b>	Deploy additional diego cells until the average free memory is 35%. This threshold assumes you have three AZs.
<b>Additional details</b>	<b>Type:</b> Gauge (%) <b>Frequency:</b> Emitted every 60 s <b>Applies to:</b> cf:diego_cells

## Diego Cell Container Capacity

<b>Description</b>	The Diego Cell Container Capacity indicator is the percentage of containers remaining that a given Diego Cell can host. Divide the <code>CapacityRemainingContainers</code> metric by the <code>CapacityTotalContainers</code> metric to get this percentage. The metric <code>CapacityRemainingContainers</code> is the remaining number of containers. The metric <code>CapacityTotalContainer</code> is the total number of containers.
<b>Source ID</b>	<code>rep</code>
<b>Metrics</b>	<code>CapacityRemainingContainers</code> <code>CapacityTotalContainers</code>
<b>Recommended thresholds</b>	< average (35%) This threshold assumes you have three AZs.
<b>How to scale</b>	Deploy additional diego cells until the average free memory is 35%. This threshold assumes you have three AZs.
<b>Additional details</b>	<b>Type:</b> Gauge (%) <b>Frequency:</b> Emitted every 60 s <b>Applies to:</b> cf:diego_cells

## Firehose performance scaling indicators

VMware recommends three key capacity scaling indicators for monitoring Firehose performance.

### Log Transport Loss Rate

<b>Description</b>	The Log Transport Loss Rate indicator is the rate of messages dropped between the Dopplers and the Firehouse. Divide the <code>dropped{direction=ingress}</code> metric by the <code>ingress</code> metric to get the loss rate. Metric <code>ingress</code> is the number of messages entering the Dopplers. <code>dropped</code> is the number of messages never delivered to the Firehose.
For more information about Loggregator components, see <a href="#">Loggregator Architecture</a> .	

<b>Source ID</b>	<code>doppler</code>
<b>Metrics</b>	<code>dropped</code> <code>ingress</code>

<b>Labels</b>	<code>{direction=ingress}</code>
<b>Details</b>	Dopplers emit two separate dropped metrics, one for ingress and one for egress. The envelopes have a <code>direction</code> label. For this indicator, use the metric with a <code>direction</code> tag with a value of <code>ingress</code> .

## Log Transport Loss Rate

<b>Rec</b>	<b>Scale indicator:</b> $\geq 0.01$
<b>om</b>	If alerting:
<b>men</b>	<b>Yellow warning:</b> $\geq 0.005$
<b>ded</b>	<b>Red critical:</b> $\geq 0.01$
<b>thre</b>	Excessive dropped messages can indicate the Dopplers or Traffic Controllers are not processing messages quickly
<b>shol</b>	enough.
<b>ds</b>	
<b>How</b>	Scale up the number of Traffic Controller and Doppler instances.
<b>to</b>	
<b>scal</b>	At approximately 40 Doppler instances and 20 Traffic Controller instances, horizontal scaling is no longer useful for
<b>e</b>	improving Firehose performance. To improve performance, add vertical scale to the existing Doppler and Traffic
	Controller instances by increasing CPU resources.
<b>Addi</b>	<b>Type:</b> Gauge (float)
<b>tion</b>	<b>Frequency:</b> Base metrics are emitted every 5 s
<b>al</b>	<b>Applies to:</b> cf:doppler
<b>deta</b>	
<b>ils</b>	

## Doppler Message Ingress Capacity

<b>Des</b>	The Doppler Ingress counter is the number of messages ingressed by the Doppler instance. Divide the sum of the rate
<b>cript</b>	of <code>ingress</code> metrics across instances by the <code>current number of Doppler instances</code> to get this average.
<b>ion</b>	
<b>Sour</b>	<code>doppler</code>
<b>ce</b>	
<b>ID</b>	
<b>Metr</b>	<code>ingress</code>
<b>ics</b>	
<b>Rec</b>	<b>Scale indicator:</b> $\geq 16,000$ envelopes per second (or 1 million envelopes per minute)
<b>om</b>	
<b>men</b>	
<b>ded</b>	
<b>thre</b>	
<b>shol</b>	
<b>ds</b>	
<b>How</b>	Increase the number of Doppler VMs in the <b>Resource Config</b> pane of the TAS for VMs tile.
<b>to</b>	
<b>scal</b>	
<b>e</b>	
<b>Addi</b>	<b>Type:</b> Counter (float)
<b>tion</b>	<b>Frequency:</b> Emitted every 5 s
<b>al</b>	<b>Applies to:</b> cf:doppler
<b>deta</b>	
<b>ils</b>	

## Reverse Log Proxy Loss Rate

**Des** The Reverse Log Proxy Loss Rate indicator is the rate of bound app logs dropped from the Reverse Log Proxies (RLP). Divide the `dropped` metric by the `ingress` metric to get this indicator.

This loss rate is specific to the RLP and does not impact the Firehose loss rate.

**Sour** `rlp`  
**ce**  
**ID**

**Metr** `ingress`  
**ics** `dropped`

**Rec** **Scale indicator:**  $\geq 0.1$   
**om** If alerting:  
**men** **Yellow warning:**  $\geq 0.01$   
**ded** **Red critical:**  $\geq 0.1$   
**thre** Excessive dropped messages can indicate that the RLP is overloaded and that the Traffic Controllers need to be scaled.  
**shol**  
**ds**

**How** Scale up the number of traffic controller instances to further balance log load.  
**to**  
**scal**  
**e**

**Addi** **Type:** Counter (Integer)  
**tion** **Frequency:** Emitted every 60 s  
**al** **Applies to:** cf:loggregator  
**deta**  
**ils**

## Firehose consumer scaling indicator

VMware recommends the following scaling indicator for monitoring the performance of consumers of the Firehose.

### Slow Consumer Drops

**Des** The Slow Consumer Drops indicator is the `slow_consumer` metric incremented for each connection the Firehose closes because a consumer cannot keep up.  
**ion** This indicator shows how fast a Firehose consumer, such as a monitoring tool nozzle, is ingesting data. If this number is anomalous, it might result in the downstream monitoring tool not having all expected data, even though that data was successfully transported through the Firehose.

**Sour** `doppler_proxy`  
**ce**  
**ID**

**Metr** `slow_consumer`  
**ics**

## Slow Consumer Drops

<b>Rec</b>	<b>Scale indicator:</b> VMware recommends scaling when the rate of Firehose Slow Consumer Drops is anomalous for a given environment.
<b>How</b>	Scale up the number of nozzle instances. You can scale a nozzle using the subscription ID specified when the nozzle connects to the Firehose. If you use the same subscription ID on each nozzle instance, the Firehose evenly distributes data across all instances of the nozzle. For example, if you have two nozzle instances with the same subscription ID, the Firehose sends half of the data to one nozzle instance and half to the other. Similarly, if you have three nozzle instances with the same subscription ID, the Firehose sends one-third of the data to each instance. If you want to scale a nozzle, the number of nozzle instances should match the number of Traffic Controller instances.
<b>Addi</b>	<b>Type:</b> Counter
<b>tion</b>	<b>Frequency:</b> Emitted every 5 s

**al** **Applies to:** cf:doppler  
**deta**  
**ils**

## Reverse Log Proxy Egress Dropped Messages

<b>Des</b>	The Reverse Log Proxy Egress Dropped Messages indicator shows the number of messages dropped when consumers of the RLP, such as monitoring tool nozzles, ingest the exiting stream of logs and metrics too slowly. Within TAS for VMs, logs and metrics enter Loggregator for transport and then egress through the Reverse Log Proxy (RLP).
<b>Sour</b>	<code>rlp</code>
<b>ce</b>	
<b>ID</b>	
<b>Metr</b>	<code>dropped</code>
<b>ics</b>	
<b>Lab</b>	<code>direction: egress</code>
<b>el</b>	
<b>Rec</b>	<b>Scale indicator:</b> Scale when the rate of <code>rlp.dropped, direction: egress</code> metrics is continuously increasing.
<b>om</b>	
<b>men</b>	
<b>ded</b>	
<b>thre</b>	
<b>shol</b>	
<b>ds</b>	
<b>How</b>	Scale up the number of nozzle instances. The number of nozzle instances should match the number of Traffic Controller instances. You can scale a nozzle using the subscription ID specified when the nozzle connects to the RLP.
<b>to</b>	
<b>scal</b>	If you use the same subscription ID on each nozzle instance, the RLP evenly distributes data across all instances of the nozzle. For example, if you have two nozzle instances with the same subscription ID, the RLP sends half of the data to one nozzle instance and half to the other. Similarly, if you have three nozzle instances with the same subscription ID, the RLP sends one-third of the data to each instance.
<b>e</b>	

## Reverse Log Proxy Egress Dropped Messages

**Additionals**

- Type:** Counter
- Frequency:** Emitted every 5 s
- Applies to:** cf:loggregator\_trafficcontroller

## Doppler Egress Dropped Messages

**Description** The Doppler Egress Dropped Messages indicator shows the number of messages that the Dopplers drop when consumers of the RLP, such as monitoring tool nozzles, ingest the exiting stream of logs and metrics too slowly. For more information about how the Dopplers transport logs and metrics through Loggregator, see [Loggregator Architecture](#) in *Loggregator Architecture*.

The `doppler.dropped` metric includes both `ingress` and `egress` directions. To differentiate between `ingress` and `egress`, see the `direction` tag on the metric.

**Source** `doppler`  
**Code**  
**ID**

**Metrics** `dropped`  
`egress`

**Label** `direction: egress`  
`el`

**Recommendations** Scale indicator **Scale when the rate of `doppler.dropped, direction: egress` metrics is continuously increasing.**

**How** Scale up the number of nozzle instances. The number of nozzle instances should match the number of Traffic Controller instances. You can scale a nozzle using the subscription ID specified when the nozzle connects to the RLP.  
**scale** If you use the same subscription ID on each nozzle instance, the RLP evenly distributes data across all instances of the nozzle. For example, if you have two nozzle instances with the same subscription ID, the RLP sends half of the data to one nozzle instance and half to the other. Similarly, if you have three nozzle instances with the same subscription ID, the RLP sends one-third of the data to each instance.

**Additionals**

- Type:** Counter
- Frequency:** Emitted every 5 s
- Applies to:** cf:doppler

## Syslog drain performance scaling indicators

There is a single key capacity scaling indicator VMware recommends for Syslog Drain performance.

These Syslog Drain scaling indicators are only relevant if your deployment contains apps using the syslog drain binding feature.

## Syslog Agent Loss Rate

<b>Descript</b>	Divide the <code>syslog_agent.dropped{direction:egress}</code> metric by the <code>syslog_agent.ingress(scope:agent)</code> metric to get the rate of messages dropped as a percentage of total message traffic through Syslog Agents. The loss rate of Syslog Agents indicates that the syslog drain destination is accepting logs too slowly.
<b>The Syslog Agent loss rate does not affect the Firehose loss rate. Message loss can occur in Syslog Agents without message loss occurring in the Firehose.</b>	
<b>Source</b>	<code>syslog_agent</code>
<b>Metrics</b>	<code>dropped</code> <code>ingress</code>
<b>Labels</b>	<code>direction:egress</code> <code>scope:agent</code>
<b>Recommendations</b>	The scaling indicator VMware recommends is the minimum Syslog Agent loss rate per minute within a five-minute window. You should scale up if the loss rate is greater than <code>0.1</code> for five minutes or longer.
<b>Scale Indicator</b>	<b>Scale indicator:</b> $\geq 0.1$
<b>Thresholds</b>	If alerting: <b>Yellow warning:</b> $\geq 0.01$ <b>Red critical:</b> $\geq 0.1$
<b>How to Scale</b>	Review the logs of the syslog destinations for intake issues and other performance issues. Scale the syslog destinations if necessary. A high Syslog Agent loss rate can indicate that Log Cache is unable to keep up with the ingestion rate for logs. If Log Cache is using Syslog Ingress and is CPU bound, this is likely the source of the syslog drops. To scale Log Cache to have more CPU resources, add more instances or choose instance types with more CPU capacity.
<b>Additional Details</b>	<b>Type:</b> Counter (Integer) <b>Frequency:</b> Emitted every 60 s

## Log cache scaling indicator

VMware recommends the following scaling indicator for monitoring the performance of log cache.

### Log Cache Caching Duration

<b>Description</b>	The Log Cache Caching Duration indicator shows the age in milliseconds of the oldest data point stored in Log Cache. Log Cache stores all messages that are passed through the Firehose in an ephemeral in-memory store. The size of this store and the cache duration are dependent on the amount of memory available on the Log Cache VM.
<b>Source</b>	<code>log_cache</code>
<b>Metrics</b>	<code>log_cache_cache_period</code>

### Log Cache Caching Duration

**Recommendations:** Scale the Log Cache VMs when the `log_cache_cache_period` metric drops below 900000 milliseconds.

**Memory deduplication thresholds:**

- Shared memory deduplication threshold
- Shared disk deduplication threshold

**How to scale:** Increase the number of Log Cache VMs in the **Resource Config** pane of the TAS for VMs tile, or choose a VM type that provides more memory.

**Scaling details:**

**Addition information:** Type: Gauge  
**Frequency:** Emitted every 15 s  
**Applies to:** cf:log-cache

## Gorouter performance scaling indicator

There is one key capacity scaling indicator VMware recommends for Gorouter performance.

The following metric appears in the Firehose in two different formats. The following table lists both formats.

### Gorouter VM CPU Utilization

<b>Description</b>	The Gorouter VM CPU Utilization indicator shows how much of a Gorouter VM's CPU is being used. High CPU utilization of the Gorouter VMs can increase latency and cause requests per second to decrease.
<b>Source ID</b>	<code>cpu</code>
<b>Metrics</b>	<code>user</code>
<b>Recommended thresholds</b>	<p><b>Scale indicator:</b> <math>\geq 60\%</math>  If alerting:  <b>Yellow warning:</b> <math>\geq 60\%</math>  <b>Red critical:</b> <math>\geq 70\%</math></p>
<b>How to scale</b>	Scale the Gorouters horizontally or vertically by editing the Router VM in the Resource Config pane of the TAS for VMs tile.
<b>Additional details</b>	<p><b>Type:</b> Gauge (float)  <b>Frequency:</b> Emitted every 60 s  <b>Applies to:</b> cf:router</p>

## UAA performance scaling indicator

There is one key capacity scaling indicator VMware recommends for UAA performance.

The following metric appears in the Firehose in two different formats. The following table lists both formats.

### UAA VM CPU Utilization

<b>Description</b>	The UAA VM CPU Utilization indicator shows how much of the UAA VM's CPU is used. High CPU utilization of the UAA VMs can cause requests per second to decrease.
<b>Source ID</b>	cpu
<b>Metrics</b>	user
<b>Recommended thresholds</b>	<b>Scale indicator:</b> $\geq 80\%$ If alerting: <b>Yellow warning:</b> $\geq 80\%$ <b>Red critical:</b> $\geq 90\%$
<b>How to scale</b>	Scale UAA horizontally or vertically. To scale UAA, navigate to the <b>Resource Config</b> pane of the TAS for VMs tile and edit the number of your <b>UAA</b> VM instances or change the VM type to a type that uses more CPU cores.
<b>Additional details</b>	<b>Type:</b> Gauge (float) <b>Frequency:</b> Emitted every 60 s <b>Applies to:</b> cf:uaa

## NFS/WebDAV backed blobstore

There is one key capacity scaling indicator for external S3 external storage.

This metric is only relevant if your deployment does not use an external S3 repository for external storage with no capacity constraints.

The following metric appears in the Firehose in two different formats. The following table lists both formats.

### External S3 External Storage

<b>Description</b>	The External S3 External Storage indicator shows the percentage of persistent disk used. <i>If applicable:</i> Monitor the percentage of persistent disk used on the VM for the NFS Server job. If you do not use an external S3 repository for external storage with no capacity constraints, you must monitor the TAS for VMs object store to push new app and buildpacks.
<b>Source ID</b>	disk
<b>Metrics</b>	persistent.percent
<b>Recommended thresholds</b>	$\geq 75\%$
<b>How to scale</b>	Give your NFS Server additional persistent disk resources. If you use an internal NFS/WebDAV backed blobstore, consider scaling the persistent disk when it reaches 75% capacity.
<b>Additional details</b>	<b>Type:</b> Gauge (%) <b>Applies to:</b> cf:nfs_server

## Reporting

In this section:

- [Reporting app, task, and service instance usage](#)
- [Reporting instance usage with apps manager](#)

## Reporting app, task, and service instance usage

You can use the Cloud Foundry Command Line Interface (cf CLI) to retrieve historical system-level and org-level usage information about your TAS for VMs apps, tasks, and service instances through the Cloud Controller and Usage Service APIs.

Usage reports are compiled from the `/v3/app_usage_events` endpoint. For more information, see [List all app usage events](#) in the Cloud Foundry API documentation.

You can also access usage information by using Apps Manager. For more information, see [Reporting instance usage with Apps Manager](#).

To retrieve current app and event information from the Cloud Controller, see [Retrieving app and event information](#) in the open-source Cloud Foundry documentation.

## Prerequisite

Before using the procedures in this topic, ensure that your user is a member of the `cloud_controller.admin` or `usage_service.audit` group. For example, a UAAC admin can add a user to the `usage_service.audit` group with the following command:

```
uaac member add usage_service.audit USERNAME
```

## Obtain system usage information

You can obtain the following system-wide usage information:

- [App Usage](#)
- [Task Usage](#)
- [Service Usage](#)
- [All Orgs App Usage](#)

## App usage

Use `curl` to make a request to `/system_report/app_usages` on the Usage Service endpoint to show system-wide app usage data:

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/system_report/app_usages" -k -v
\
-H "authorization: `cf oauth-token`"
{
"report_time": "2017-04-11 22:28:24 UTC",
"monthly_reports": [
{
"month": 4,
"year": 2017,
```

```

        "average_app_instances": 17855.256153713308,
        "maximum_app_instances": 18145,
        "app_instance_hours": 4686533.080277303
    }
],
"yearly_reports": [
{
    "year": 2017,
    "average_app_instances": 16184.9,
    "maximum_app_instances": 18145,
    "app_instance_hours": 39207433.0802773
}
]
}

```

The table below describes the data generated by this report:

Value	Calculation Method
app_instance_hours	The total number of hours app instances have been running on the foundation for the month or year.
average_app_instances	The total app_instance_hours on the foundation for the month or year divided by the total hours for that time period.  <b>Example:</b> For the month of January, 100 apps run for 300 hours each, generating a value of 30000 for app_instance_hours. When divided by 744, the total number of hours in January, you get a value of 40.3 for average_app_instances.  <b>Notice:</b> That average_app_instances is calculated against the current running hours. This is most relevant when checking the report for the current month. If you look at the report_time in the example above, you'll see that the report was run on the 11th of April. Having a value of 4686533.080277303 for app_instance_hours when divided by 262.467, approximately the total number of hours for the first 11 days of April, you get an approx. value of 17855 for average_app_instances.
maximum_app_instances	The highest concurrent number of app instances running on the foundation for the month or year.

## Task usage

Use `curl` to make a request to `/system_report/task_usages` on the Usage Service endpoint to show system-wide task usage data:

```

$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/system_report/task_usages" -k -v
\
-H "authorization: `cf oauth-token`"
{
  "report_time": "2017-04-11T22:33:48.971Z",
  "monthly_reports": [
    {
      "month": 4,
      "year": 2017,
      "total_task_runs": 235,
      "maximum_concurrent_tasks": 7,
    }
  ]
}

```

```

        "task_hours": 43045.201944444445
    }
],
"yearly_reports": [
{
    "year": 2017,
    "total_task_runs": 2894,
    "maximum_concurrent_tasks": 184,
    "task_hours": 45361.26694444445
}
]
}

```

## Service usage

Use `curl` to make a request to `/system_report/service_usages` on the Usage Service endpoint to show system-wide service usage data:

```

$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/system_report/service_usages" -k
-v \
-H "authorization: `cf oauth-token`"
{
    "report_time": "2017-05-11 18:29:14 UTC",
    "monthly_service_reports": [
        {
            "service_name": "fake-service-0507f1fd-2340-49a6-9d43-a347a5f5f6be",
            "service_guid": "177dcfde-cd51-4058-bd86-b98015c295f5",
            "usages": [
                {
                    "month": 1,
                    "year": 2017,
                    "duration_in_hours": 0,
                    "average_instances": 0,
                    "maximum_instances": 0
                },
                {
                    "month": 2,
                    "year": 2017,
                    "duration_in_hours": 0,
                    "average_instances": 0,
                    "maximum_instances": 0
                },
                {
                    "month": 3,
                    "year": 2017,
                    "duration_in_hours": 4.18222222222227,
                    "average_instances": 0,
                    "maximum_instances": 2
                },
                {
                    "month": 4,

```

```
"year": 2017,
"duration_in_hours": 2176.962222222186,
"average_instances": 3,
"maximum_instances": 7
},
{
"month": 5,
"year": 2017,
"duration_in_hours": 385.6138888888854,
"average_instances": 1.5,
"maximum_instances": 3
}
],
"plans": [
{
"usages": [
{
"month": 1,
"year": 2017,
"duration_in_hours": 0,
"average_instances": 0,
"maximum_instances": 0
},
{
"month": 2,
"year": 2017,
"duration_in_hours": 0,
"average_instances": 0,
"maximum_instances": 0
},
{
"month": 3,
"year": 2017,
"duration_in_hours": 4.18222222222227,
"average_instances": 0,
"maximum_instances": 2
},
{
"month": 4,
"year": 2017,
"duration_in_hours": 1465.6388888888941,
"average_instances": 2,
"maximum_instances": 5
},
{
"month": 5,
"year": 2017,
"duration_in_hours": 385.6138888888854,
"average_instances": 1.5,
"maximum_instances": 3
}
```

```

        ],
        "service_plan_name": "fake-plan",
        "service_plan_guid": "ac09f607-f4e5-4807-af16-e95856061bd7"
    }
]
}
]
}
```

## All orgs usage

The `app_usages` endpoint directly under your system domain returns system-wide app usage for all orgs that you have access to. The command works like the org-specific [App Usage](#) command, except you do not supply an org GUID. You can set `order_by` to either `total_instance_hours` or `megabyte_hours`.

The `order_by` ordering defaults to ascending, which lists orgs with the most usage at the end of the output. To change the sort ordering to descending, prepend the `order_by` argument with a `-`, as in `order_by=-megabyte_hours`.

Use `curl` to make a request to `/app_usages` on the Usage Service endpoint to show system-wide organization usage data:

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/app_usages?start=2018-010-01&end=2018-11-01&order_by=total_instance_hours" -k -v \
-H "authorization: `cf oauth-token`"
{
  "period_start": "2018-01-10T00:00:00Z",
  "period_end": "2018-11-01T23:59:59Z",
  "Organizations": [
    {
      "guid": "d5c9f947-df85-45af-abab-00a2174598f9",
      "total_instance_hours": "91535.6",
      "megabyte_hours": "1830712.2"
    },
    {
      "guid": "a9605fa4-99da-4932-84f5-3db8698c1fc1",
      "total_instance_hours": "99440.8",
      "megabyte_hours": "96698582.2"
    }
  ]
}
```

## Obtain org usage information

You can obtain the following org-specific usage information:

- [App Usage](#)
- [Task Usage](#)
- [Service Usage](#)

You must have the GUID of the org you want to obtain information about to perform the procedures in this section. To retrieve your org GUID, run the `cf org` command:

```
$ cf org YOUR-ORG --guid
```

## App usage

Use `curl` to make a request to `/app_usages` on the Usage Service endpoint to show app usage in an org. You must complete the placeholders in `start=YYYY-MM-DD&end=YYYY-MM-DD` to define a date range.

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/organizations/YOUR-ORG-GUID/app_usages?start=YYYY-MM-DD&end=YYYY-MM-DD" \
-k -v \
-H "authorization: `cf oauth-token`"

{
  "organization_guid": "88e485fa-2222-4993-8ef5-bac3711adfee",
  "period_start": "2019-01-16T00:00:00Z",
  "period_end": "2019-01-17T23:59:59Z",
  "app_usages": [
    {
      "space_guid": "d6988d4d-6175-4dee-b219-a6eabbc05514",
      "space_name": "development",
      "app_name": "static2",
      "app_guid": "1afc2b20-dd41-4ba4-8e6e-c894b5a2cb23",
      "parent_application_name": "static2",
      "parent_application_guid": "1afc2b20-dd41-4ba4-8e6e-c894b5a2cb23",
      "instance_count": 1,
      "memory_in_mb_per_instance": 1024,
      "duration_in_seconds": 172800
    },
    {
      "space_guid": "d6988d4d-6175-4dee-b219-a6eabbc05514",
      "space_name": "development",
      "app_name": "static",
      "app_guid": "54e767ff-4f83-45b1-bf06-46c501217845",
      "parent_application_name": "static",
      "parent_application_guid": "54e767ff-4f83-45b1-bf06-46c501217845",
      "instance_count": 1,
      "memory_in_mb_per_instance": 1024,
      "duration_in_seconds": 172800
    }
  ]
}
```

You might see results with `"instance_count": 0`. This happens when a v3 app is pushed but has processes that are not scaled up. The memory configuration and duration are still stored and can be useful for resource management. Apps with '0' instances are not counted in the App Usages System Report.

## Task usage

Use `curl` to make a request to `/task_usages` on the Usage Service endpoint to show task usage in an org. You must complete the placeholders in `start=YYYY-MM-DD&end=YYYY-MM-DD` to define a date range.

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/organizations/YOUR-ORG-GUID/task_usages?start=YYYY-MM-DD&end=YYYY-MM-DD" \
-k -v \
-H "authorization: `cf oauth-token`"
{
  "organization_guid": "8f88362f-547c-4158-808b-4605468387d5",
  "period_start": "2014-01-01",
  "period_end": "2017-04-04",
  "spaces": [
    "e6445eb3-fdac-4049-bafc-94d1703d5e78": {
      "space_name": "smoketest",
      "task_summaries": [
        {
          "parent_application_guid": "04cd29d5-1f9e-4900-ac13-2e903f6582a9",
          "parent_application_name": "task-dummy-app",
          "memory_in_mb_per_instance": 256,
          "task_count_for_range": 54084,
          "concurrent_task_count_for_range": 5,
          "total_duration_in_seconds_for_range": 37651415
        }
      ]
    },
    "b66665e4-873f-4482-acf1-89307ba9c6e4": {
      "space_name": "smoketest-experimental",
      "task_summaries": [
        {
          "parent_application_guid": "d941b689-4a27-44ec-91d3-1f97434dbed9",
          "parent_application_name": "console-blue",
          "memory_in_mb_per_instance": 256,
          "task_count_for_range": 14,
          "concurrent_task_count_for_range": 2,
          "total_duration_in_seconds_for_range": 20583
        }
      ]
    }
  ]
}
```

In the `/task_usages` endpoint, `memory_in_mb_per_instance` is the memory of the task.

## Service usage

Use `curl` to make a request to `/service_usages` on the Usage Service endpoint to show service usage in an org. You must complete the placeholders in `start=YYYY-MM-DD&end=YYYY-MM-DD` to define a date range.

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/organizations/`cf org YOUR-ORG -guid`/service_usages?start=YYYY-MM-DD&end=YYYY-MM-DD" -k -v -H "authorization: `cf oauth-token`"
{
  "organization_guid": "8d83362f-587a-4148-806b-4407428887b5",
  "period_start": "2016-06-01T00:00:00Z",
  "period_end": "2016-06-13T23:59:59Z",
  "service_usages": [
    {
      "deleted": false,
      "duration_in_seconds": 1377982.52,
      "service_guid": "02802293-b769-44cc-807f-eee331ba9b2b",
      "service_instance_creation": "2016-01-20T18:48:16.000Z",
      "service_instance_deletion": null,
      "service_instance_guid": "b25b4481-19aa-4504-82c9-f303e7e9ed6e",
      "service_instance_name": "something-usage-db",
      "service_instance_type": "managed_service_instance",
      "service_name": "my-mysql-service",
      "service_plan_guid": "70915a70-7311-4f3e-ab0d-4a7dfd3ef2d9",
      "service_plan_name": "20gb",
      "space_guid": "e6445eb3-fdac-4049-bafc-94d1703d5e78",
      "space_name": "outer-space"
    }
  ]
}
```

## Usage availability

The app, task, and service instance usage data returned from the Usage Service is delayed to ensure accuracy. The `/usage_availability` endpoint can be used to retrieve the date which the Usage Service data is accurate to. The Usage Service is able to provide data for time periods up to and including this date.

Use the following curl command to retrieve the current usage availability timestamp:

```
curl "https://app-usage.YOUR-SYSTEM-DOMAIN/usage_availability" -k -v
{"date":"2019-01-01"}
```

Where `YOUR-SYSTEM-DOMAIN` is the system domain of your VMware Tanzu Application Service for VMs (TAS for VMs) environment.

## Monitor usage service

VMware recommends monitoring usage service at regular intervals with a recurring CI task or third-party monitoring tool. Usage service runs asynchronous jobs such as fetching usage events from the Cloud Controller API.

Use the following curl command to check for failed jobs:

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/heartbeat/failed_jobs" -k -v
Ok.
```

By default, the `error_threshold` is set to 1 and the command does the following:

- Succeeds with HTTP status `200` if the number of failed jobs is lower than the threshold
- Fails with HTTP status `500` if it exceeds the threshold

The following example specifies a threshold value:

```
$ curl "https://app-usage.YOUR-SYSTEM-DOMAIN/heartbeat/failed_jobs?error_threshold=5"
-k -v
Ok.
```

## Usage data retention

Usage service retains all summarized monthly data and never deletes it. The following endpoints return data for all years:

- `/system_report/app_usages`
- `/system_report/task_usages`
- `/system_report/service_usages`

For examples of how to curl these endpoints, see [Obtain system usage information](#).

Usage service deletes old records of granular data, such as usage per app, per day. By default, granular data is deleted after 365 days, so the following endpoints return data for the last 365 days. The retention period is configurable in the **Advanced Features** pane of the TAS for VMs tile.

These endpoints return granular data:

- `/organizations/ORG-GUID/app_usages`
- `/organizations/ORG-GUID/task_usages`
- `/organizations/ORG-GUID/service_usages`
- `/app_usages`

## Example: Autogenerated database usage reports

For security compliance and record keeping, some Operations Manager customers create Concourse CI/CD pipelines that regularly run JavaScript scripts to do the following:

1. Call the `app-usage` APIs in the previous sections of this topic, and the [Security event logging](#) topic, to collect data about service instances from an Operations Manager foundation. This data includes database instance information such as tile or database type, database creator, and date of creation or deletion.
2. Merge and format the data about services instances into a JSON output file and save it to an S3 bucket.
3. Input the file to another process that does the following:
  1. Parses the data.
  2. Eliminates duplicate entries from previous reports.

3. Sends the data to a database compliance system through APIs.

## Reporting instance usage with Apps Manager

You can retrieve app, task, and service instance usage information using Apps Manager using the Accounting Report or the Usage Report for all apps in your VMware Tanzu Application Service for VMs (TAS for VMs).

You can also retrieve app, task, and service instance usage information using the Usage service API, or the Cloud Foundry API from the Cloud Foundry Command Line Interface (cf CLI). For more information, see [Monitoring App, Task, and Service Instance Usage](#).

There are two ways to monitor app, task, and service instance usage from Apps Manager. The Accounting Report provides a summarized report, and the Usage Report provides a more detailed view of the data.

## View the Accounting Report

The Accounting Report displays instance usage information for all orgs in your [Operations Manager](#) deployment except the **system** org. The Accounting Report provides a high-level overview of your usage by displaying your monthly count of app, task, and service instances.

To access the Accounting Report:

1. Log in to the Apps Manager as an admin. For more information, see [Logging in to Apps Manager](#)
2. Select **Accounting Report**.
3. In **App Statistics** and **Service Usage**, view the average and maximum instances in use per month, calculated from the usage service for the indicated time period. The **App Statistics** table shows the following data:
  - o **Avg Instances:** Average number of instances in use during the time period
  - o **Max Concurrent:** Maximum number of concurrent Application Instances and Tasks in use during the time period, using the `/system_report/max_apps_and_tasks` endpoint. This is not the summation of Apps and Tasks because the maximums may not occur at the same time.
    - Apps: Maximum number of concurrent Application Instances using the `/system_report/app_usages` endpoint
    - Tasks: Maximum number of concurrent Tasks using the `/system_report/task_usages` endpoint
  - o **Instance Hours:** Application and Task instance hours in use via the `/system_report/max_apps_and_tasks` endpoint
    - Apps: Application Instance hours in use using the `/system_report/app_usages` endpoint
    - Tasks: Task instance hours using the `/system_report/task_usages`

# Accounting Report

Monthly count of App Instances in use for all orgs (not including the system org)

APP STATISTICS	2017	JANUARY	FEBRUARY	MARCH	APRIL
Avg Instances	0.0	0	0	0.0	-
Max Concurrent	2.0	0	0	2.0	-
Apps	2.0	0	0	2.0	-
Tasks	0.0	0	0	0.0	-
Instance Hours	0.0	0	0	0.0	-
Apps	0.0	0	0	0.0	-
Tasks	0.0	0	0	0.0	-
SERVICE USAGE	2017	JANUARY	FEBRUARY	MARCH	APRIL

## View the Usage Report

The Usage Report provides a more granular view of your usage by detailing app, task, and service instance usage information for all spaces in a particular org, excluding the **system** org.

To access the Usage Report:

1. Log in to the Apps Manager as an admin, or as an account with the **Org Manager** or **Org Auditor** role. For more information about managing roles, see [Managing User Accounts and Permissions Using the Apps Manager](#).
2. From the drop-down menu, select the org for which you want to view a usage report.
3. Click **Usage Report**.



Usage Report		Period	May 1st - Current	DOWNLOAD ZIP
Org My-Org		App + Task Instance Hours 576.7 hrs	App + Task Memory 111.4 GB hrs	Service Instance Hours 486.7 hrs

The report provides total usage information for each of your spaces.

Space	App + Task Instance Hours	App + Task Memory	Service Instance Hours
development	74.1 hrs	74.1 GB hrs	120.1 hrs
production	0.0 hrs	0.0 GB hrs	120.0 hrs
staging	0.0 hrs	0.0 GB hrs	0.0 hrs

To display more detailed information about app, task, and service instance usage in a space, click the name of the space for an expanded view.

Space	App + Task Instance Hours	App + Task Memory	Service Instance Hours					
development	74.1 hrs	74.1 GB hrs	120.1 hrs					
Apps (1)	App Instance Count (#)	Task Instance Count (#)	Instance Time (hrs)	Memory Usage (GB hrs)				
spring-music-sample-app	0.2	1	1	74.0	0.0	74.05	0.00	74.05
Services (1)	Plan	Instance Hours		App Total	Task Total	App	Task	Total
app-autoscaler (1)		120.1						
my-autoscaler	standard	120.1						

## Loggregator

In this section:

- [Loggregator guide for TAS for VMs operators](#)
- [Deploying a nozzle to your Loggregator Firehose](#)
- [Installing the Loggregator Firehose plug-in for cf CLI](#)

## Loggregator Guide for TAS for VMs Operators

Here you can view information for VMware Tanzu Application Service for VMs (TAS for VMs) deployment operators about how to configure the Loggregator system to avoid data loss with high volumes of logging and metrics data.

For more information about the Loggregator system, see [Loggregator Architecture](#).

## Loggregator message throughput and reliability

You can measure both the message throughput and message reliability rates of your Loggregator system.

### Measuring message throughput

To measure the message throughput of the Loggregator system, you can monitor the total number of egress messages from all Loggregator Agents in your deployment using the `metron.egress` metric.

If you do not use a monitoring platform, you can measure the overall message throughput of your Loggregator system. To measure the overall message throughput:

1. Log in to the Cloud Foundry Command Line Interface (cf CLI) with your admin credentials by running:

```
cf login
```

2. Install the TAS for VMs Firehose plug-in. For more information, see [Install the plug-in](#) in *Installing the Loggregator Firehose Plug-in for cf CLI*.
3. Install Pipe Viewer by running:

```
apt-get install pv
```

4. Run:

```
cf nozzle -n | pv -l -i 10 -r > /dev/null
```

## Measuring message reliability

To measure the message reliability rate of your Loggregator system, you can run black-box tests.

## Scaling Loggregator

Most Loggregator configurations use preferred resource defaults. For more information about customizing these defaults and planning the capacity of your Loggregator system, see [Key Capacity Scaling Indicators](#).

## Scaling nozzles

Nozzles are programs that consume data from the Loggregator Firehose. Nozzles can be configured to select, buffer, and transform data, and to forward it to other apps and services. You can scale a nozzle using the subscription ID specified when the nozzle connects to the Firehose. If you use the same subscription ID on each nozzle instance, the Firehose evenly distributes data across all instances of the nozzle.

For example, if you have two nozzle instances with the same subscription ID, the Firehose sends half of the data to one nozzle instance and half to the other. Similarly, if you have three nozzle instances with the same subscription ID, the Firehose sends one-third of the data to each instance.

If you want to scale a nozzle, the number of nozzle instances must match the number of Traffic Controller instances:

Note, the number of nozzle instances = Number of Traffic Controller instances.

Stateless nozzles handle scaling. If a nozzle buffers or caches the data, the nozzle author must test the results of scaling the number of nozzle instances up or down.

You can deactivate the Firehose. In place of the Firehose, you can configure an aggregate log and metric drain for your foundation. For more information, see [Configure System Logging](#) in *Configuring TAS for VMs*.

## Slow nozzle alerts

The Traffic Controller alerts the nozzle programs if they consume events too slowly. The following metrics can be used to identify slow consumers:

- For v1 consumers: `doppler_proxy.slow_consumer` is incremented as consumers are disconnected for being slow.

- For v2 consumers: `doppler.dropped{direction="egress"}` or `rlp.dropped{direction="egress"}` are incremented when a v2 consumer fails to keep up.

For more information about the Traffic Controller, see [Loggregator Architecture](#) in *Loggregator Architecture*.

## Forwarding logs to an external service

You can configure TAS for VMs to forward log data from apps to an external aggregator service. For information about how to bind apps to the external service and configure it to receive logs from TAS for VMs, see [Streaming App Logs to Log Management Services](#).

## Log message size constraints

When a Diego Cell emits app logs to Loggregator, Diego breaks up log messages greater than approximately 60 KiB into multiple envelopes.

## Deploying a Nozzle to your Cloud Foundry Loggregator Firehose

You can deploy a nozzle app to the VMware Tanzu Application Service for VMs (TAS for VMs) Loggregator Firehose.

For more information about nozzles and the Loggregator Firehose, see [Loggregator Architecture](#). The TAS for VMs Loggregator team created an example nozzle app for use with this tutorial.

The following procedure deploys an example nozzle to the Firehose of a TAS for VMs installation deployed locally with BOSH Lite v2. For more information about BOSH Lite v2, see [VirtualBox BOSH Lite v2](#) in the BOSH documentation.

To reduce the load on custom nozzles that you develop, you can request Firehose subscriptions that emit only metrics on an allow list. For examples, see `rlpreader` and `rlptypereader` in the [Loggregator Tools](#) repository and [V2 Subscriptions](#) in the Loggregator Release repository in GitHub.

You can deactivate the Firehose. In place of the Firehose, you can configure an aggregate log and metric drain for your foundation. For more information, see [Configure System Logging](#) in *Configuring TAS for VMs*.

## Prerequisites

Before you deploy a nozzle to the Loggregator Firehose, you must have:

- BOSH CLI installed locally. For more information, see [BOSH CLI](#) in the BOSH documentation.
- Spiff installed locally and added to the load path of your shell. For more information, see the [Spiff](#) repository on GitHub.
- BOSH Lite v2 deployed locally using VirtualBox. For more information about BOSH Lite v2, see [VirtualBox BOSH Lite v2](#) in the BOSH documentation.
- A working TAS for VMs deployment, including Loggregator, deployed with your local BOSH Lite v2. This deployment serves as the source of data. Use the `provision_cf` script included in the BOSH Lite v2 release.



Deploying TAS for VMs can take several hours depending on your internet bandwidth, even when using the automated `provision_cf` script.

## Step 1: Downloading Cloud Foundry BOSH manifest

To download the BOSH manifest:

- Run `bosh deployments` to identify the name of your current BOSH deployment:

```
$ bosh deployments
+-----+-----+
-----+
| Name      | Releases    | Stemcells
|
+-----+-----+
-----+
| cf-example | cf-mysql/10 | bosh-vsphere-esxi-ubuntu-trusty-go_agent/2690.3 |
|           | cf/183.2     |
|
+-----+-----+
-----+
```

- Run `bosh manifest -d MY-DEPLOYMENT MY-MANIFEST` to download and save each BOSH deployment manifest. You need this manifest to locate information about your databases. Repeat these instructions for each manifest. Replace `MY-DEPLOYMENT` with the name of the current BOSH deployment. For this procedure, use `cf.yml` as `MY-MANIFEST`.

```
$ bosh manifest -d cf-example cf.yml
Deployment manifest saved to `cf.yml'
```

- Place the .yml file in a secure location.

## Step 2: Adding UAA client

You must authorize the example nozzle as a UAA client for your TAS for VMs deployment. To do this, add an entry for the example nozzle as a `client` for `uaa` under the `properties` key in your TAS for VMs deployment manifest YAML file. You must enter the example nozzle object in the correct location in the manifest, and with the correct indentation.

To add the nozzle as a UAA client for your deployment:

- Open the deployment manifest in a text editor.
- Locate the left-aligned `properties` key.
- Under the `properties` key, locate `uaa` at the next level of indentation.
- Under the `uaa` key, locate the `clients` key at the next level of indentation.
- Enter properties for the `example-nozzle` at the next level of indentation, exactly as shown. The `...` in the text indicates other properties that might populate the manifest at each level in the

hierarchy.

```
properties:
...
uaa:
...
clients:
...
example-nozzle:
  access-token-validity: 1209600
  authorized-grant-types: client_credentials
  override: true
  secret: example-nozzle
  authorities: oauth.login,doppler.firehose
```

6. Save the deployment manifest file.

## Step 3: Redeploying TAS for VMs

To redeploy TAS for VMs with BOSH, run:

```
bosh -e BOSH-ENVIRONMENT deploy
```

Where `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director.

For example:

```
$ bosh -e dev deploy
Acting as user 'admin' on deployment 'cf-warden' on 'Bosh Lite Director'
Getting deployment properties from director...
Detecting deployment changes
-----
Releases
No changes
Compilation
No changes
Update
No changes
Resource pools
No changes
Disk pools
No changes
Networks
No changes
Jobs
No changes
Properties
uaa
clients
example-nozzle
  + access-token-validity: 1209600
  + authorized-grant-types: authorization_code,client_credentials,refresh_token
```

```
+ override: true
+ secret: example-nozzle
+ scope: openid,oauth.approvals,doppler.firehose
+ authorities: oauth.login,doppler.firehose
Meta
No changes
Please review all changes carefully
Deploying
-----
Are you sure you want to deploy? (type 'yes' to continue):yes
```

## Step 4: Cloning an example release

The TAS for VMs Loggregator team created an example nozzle app for use with this tutorial.

To clone the example nozzle release:

1. Clone the main release repository from the example-nozzle-release repository on GitHub by running:

```
git clone https://github.com/cloudfoundry-incubator/example-nozzle-release.git
```

2. Go to the `example-nozzle-release` directory by running:

```
cd example-nozzle-release
```

3. Update all of the included submodules by running:

```
git submodule update --init --recursive
```

For example:

```
$ git submodule update --init --recursive
Submodule 'src/github.com/cloudfoundry-incubator/example-nozzle' (git@github.com:cloudfoundry-incubator/example-nozzle.git) registered for path 'src/github.com/cloudfoundry-incubator/example-nozzle'
Submodule 'src/github.com/cloudfoundry-incubator/uaago' (git@github.com:cloudfoundry-incubator/uaago.git) registered for path 'src/github.com/cloudfoundry-incubator/uaago'
...
Cloning into 'src/github.com/cloudfoundry-incubator/example-nozzle'...
...
```

## Step 5: Preparing nozzle manifest

To prepare the nozzle deployment manifest:

1. In the `example-nozzle-release` directory, navigate to the `templates` directory by running:

```
cd templates
```

Within this directory, examine the two YAML files. `bosh-lite-stub.yml` contains the values used to populate the missing information in `template.yml`. By combining these two files, you can create a deployment manifest for the nozzle.

2. Create a `tmp` directory for the compiled manifest.
3. Use Spiff to compile a deployment manifest from the template and stub by running:

```
spiff merge templates/template.yml templates/bosh-lite-stub.yml > tmp/manifest_
bosh_lite.yml
```

Save this manifest.

4. To identify the names of all deployments in the environment that you specify, run:

```
bosh -e BOSH-ENVIRONMENT deployments
```

Where `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director.

5. To obtain your BOSH Director UUID, run:

```
bosh -e BOSH-ENVIRONMENT env --column=uuid
```

Where `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director. For example:

```
$ bosh -e dev env --column=uuid
```

6. In the compiled nozzle deployment manifest, locate the `director_uuid` property. Replace `PLACEHOLDER-DIRECTOR-UUID` with your BOSH Director UUID.

```
compilation:
  cloud_properties:
    name: default
  network: example-nozzle-net
  reuse_compilation_vms: true
  workers: 1
  director_uuid: PLACEHOLDER-DIRECTOR-UUID
```

If you do not want to see the complete deployment procedure, run `scripts/make_manifest_spiff_bosh_lite` to prepare the manifest.

## Step 6: Creating nozzle BOSH release

To create a nozzle BOSH release, run:

```
bosh -e BOSH-ENVIRONMENT create-release --name RELEASE-NAME
```

Where:

- `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director.
- `RELEASE-NAME` is `example-nozzle` to match the UAA client that you created in the TAS for VMs deployment manifest.

For example:

```
$ bosh -e dev create-release --name example-nozzle
Syncing blobs...
...
```

## Step 7: Uploading nozzle BOSH release

Upload the nozzle BOSH release that you created in [Step 6: Create nozzle BOSH release](#).

To upload the BOSH release, run:

```
bosh -e BOSH-ENVIRONMENT upload-release
```

Where `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director.

For example:

```
$ bosh -e dev upload-release
Acting as user 'admin' on 'Bosh Lite Director'

Copying packages
\-----
example-nozzle
golang1.7

Copying jobs
\-----
example-nozzle

Generated    /var/folders/4n/qs1rjbmd1c5gfb78m3_06j6r0000gn/T/d20151009-71219-17a5m49/d20151009-71219-rts928/release.tgz
Release size: 59.2M

Verifying release...
...
Release info
\-----
Name: nozzle-test
Version: 0+dev.2

Packages
- example-nozzle (b0944f95eb5a332e9be2adfb4db1bc88f9755894)
- golang1.7 (b68dc9557ef296cb21e577c31ba97e2584a5154b)

Jobs
- example-nozzle (112e01c6ee91e8b268a42239e58e8e18e0360f58)

License
- none

Uploading release
```

## Step 8: Deploying nozzle

To deploy the nozzle, run:

```
bosh -e BOSH-ENVIRONMENT deploy
```

Where `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director.

For example:

```
$ bosh -e dev deploy
Acting as user 'admin' on deployment 'example-nozzle-lite' on 'Bosh Lite Director'
Getting deployment properties from director...
Unable to get properties list from director, trying without it...
Cannot get current deployment information from director, possibly a new deployment
Please review all changes carefully

Deploying
\-----
Are you sure you want to deploy? (type 'yes' to continue):yes
```

## Step 9: Viewing nozzle output

The example nozzle outputs all of the data originating coming from the Firehose to its log files. To view this data, SSH into the `example-nozzle` VM and examine the logs.

To view nozzle output:

- Access the nozzle VM at the IP address configured in the nozzle manifest template stub, `./templates/bosh-lite-stub.yml`, by running:

```
bosh -e BOSH-ENVIRONMENT ssh
```

Where `BOSH-ENVIRONMENT` is the alias that you set for your BOSH Director.

For example:

```
$ bosh -e dev ssh example-nozzle
Welcome to Ubuntu 14.04.1 LTS (GNU/Linux 3.19.0-25-generic x86_64)
Documentation: https://help.ubuntu.com/
Last login: Wed Sep 23 21:29:50 2015 from 192.0.2.1
```

- Use the `cat` command to output the `stdout` log file.

```
$ cat /var/vcap/sys/log/example-nozzle/example-nozzle.stdout.log
===== Streaming Firehose (will only succeed if you have admin credentials)
origin:"bosch-system-metrics-forwarder" eventType:ValueMetric timestamp:
1541091851000000000 deployment:"cf-c42ae2c4dfb6f67b6c27" job:"logger_or_trafficcontroller" index:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" i
```

```

p:"" tags:>key:"id" value:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" > tag
s:>key:"source_id" value:"bosh-system-metrics-forwarder" > valueMetric:
>"system.swap.percent" value:0 unit:"Percent" >
origin:"bosh-system-metrics-forwarder" eventType:ValueMetric timestamp:
1541091851000000000 deployment:"cf-c42ae2c4dfb6f67b6c27" job:"loggregator_trafficcontroller" index:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" i
p:"" tags:>key:"id" value:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" > tag
s:>key:"source_id" value:"bosh-system-metrics-forwarder" > valueMetric:
>"system.swap.kb" value:0 unit:"Kb" >
origin:"bosh-system-metrics-forwarder" eventType:ValueMetric timestamp:
1541091851000000000 deployment:"cf-c42ae2c4dfb6f67b6c27" job:"loggregator_trafficcontroller" index:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" i
p:"" tags:>key:"id" value:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" > tag
s:>key:"source_id" value:"bosh-system-metrics-forwarder" > valueMetric:
>"system.disk.ephemeral.percent" value:3 unit:"Percent" >
origin:"bosh-system-metrics-forwarder" eventType:ValueMetric timestamp:
1541091851000000000 deployment:"cf-c42ae2c4dfb6f67b6c27" job:"loggregator_trafficcontroller" index:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" i
p:"" tags:>key:"id" value:"d1dfffe15-5894-44de-b7f0-ad43161a0a7b" > tag
s:>key:"source_id" value:"bosh-system-metrics-forwarder" > valueMetric:
>"system.healthy" value:1 unit:"b" >
origin:"gorouter" eventType:ValueMetric timestamp:1541091851218590916 deployment:"cf-c56ab7c4dfb6f67b6c28" job:"router" index:"d5d1b5a4-2497-4679-8d3b-66ffc978d829" ip:"10.0.4.13" tags:>key:"source_id" value:"gorouter" > valueMetric:>"uptime" value:3.273478e+06 unit:"seconds" >
origin:"netmon" eventType:ValueMetric timestamp:1541091851234217334 deployment:"cf-c56ab7c4dfb6f67b6c28" job:"diego_cell" index:"8007afda-3bff-4856-857f-a47a43cbf994" ip:"10.0.4.18" tags:>key:"source_id" value:"netmon" > valueMetric:>"name" value:13 unit:"count" >
origin:"netmon" eventType:ValueMetric timestamp:1541091851234129669 deployment:"cf-c56ab7c4dfb6f67b6c28" job:"diego_cell" index:"8007afda-3bff-4856-857f-a47a43cbf994" ip:"10.0.4.18" tags:>key:"source_id" value:"netmon" > valueMetric:>"numCPUS" value:2 unit:"count" >
origin:"netmon" eventType:ValueMetric timestamp:1541091851234292367 deployment:"cf-c56ab7c4dfb6f67b6c28" job:"diego_cell" index:"8007afda-3bff-4856-857f-a47a43cbf994" ip:"10.0.4.18" tags:>key:"source_id" value:"netmon" > valueMetric:>"memoryStats.numBytesAllocated" value:542328 unit:"count" >
origin:"netmon" eventType:ValueMetric timestamp:1541091851234279470 deployment:"cf-c56ab7c4dfb6f67b6c28" job:"diego_cell" index:"8007afda-3bff-4856-857f-a47a43cbf994" ip:"10.0.4.18" tags:>key:"source_id" value:"netmon" > valueMetric:>"memoryStats.numBytesAllocatedStack" value:655360 unit:"count" >
...

```

## Installing the Loggregator Firehose Plug-in for cf CLI

You can use the Loggregator Firehose Plug-in for the Cloud Foundry Command Line Interface (cf CLI).

The Loggregator Firehose plug-in for the cf CLI allows VMware Tanzu Application Service for VMs (TAS for VMs) admins to access the output of the Loggregator Firehose. The output of the Firehose includes logs

and metrics from apps deployed on TAS for VMs as well as metrics from TAS for VMs platform components. For more information about the Firehose, see the [Loggregator Architecture](#) section of the [Loggregator Architecture](#) topic.

For more information about using plug-ins with the cf CLI, see [Using cf CLI plug-ins](#).

You can deactivate the Firehose. In place of the Firehose, you can configure an aggregate log and metric drain for your foundation: For more information, see [Configure System Logging](#) in [Configuring TAS for VMs](#).

## Prerequisites

Before you install the Loggregator Firehose plug-in, you need the following prerequisites:

- Admin access to the TAS for VMs deployment that you want to monitor
- Cloud Foundry Command Line Interface (cf CLI) v6.12.2 or later

For information about downloading, installing, and uninstalling the cf CLI, see [Installing the cf CLI](#).

## Installing the plug-in

To install the Loggregator Firehose plug-in:

1. Add the CF Community plug-in repository to your cf CLI plug-ins by running:

```
cf add-plugin-repo CF-Community https://plugins.cloudfoundry.org
```

2. Install the Firehose plug-in from the CF Community plug-in repository by running:

```
cf install-plugin -r CF-Community "Firehose Plugin"
```

## Viewing the Firehose

To view the streaming output of the Firehose, which includes logging events and metrics from TAS for VMs system components, run:

```
cf nozzle --debug
```

You must be logged in as a TAS for VMs admin to access the Firehose.

For more information about logging and metrics in TAS for VMs, see [Loggregator Architecture](#).

## Uninstalling the plug-in

To uninstall the Loggregator Firehose plug-in:

1. Run `cf plugins` to see a list of installed plug-ins.

```
$ cf plugins
Listing Installed Plugins...
OK
Plugin Name      Version   Command Name   Command Help
```

FirehosePlugin 0.6.0 nozzle	Command to print out messages from the firehose
-----------------------------	-------------------------------------------------

2. To uninstall the plug-in, run:

```
cf uninstall-plugin FirehosePlugin
```

# Troubleshooting and diagnostics

In this section:

- [Diagnosing deployment problems](#)
- [Troubleshooting slow requests in TAS for VMs](#)
- [Troubleshooting TCP routing](#)
- [Troubleshooting router error responses](#)
- [Troubleshooting TAS for VMs on GCP](#)
- [Checking TAS for VMs state after a power failure on vSphere](#)

## Diagnosing TAS for VMs deployment problems

You can diagnose issues that you encounter when installing products such as VMware Tanzu Application Service for VMs (TAS for VMs) with VMware Tanzu Operations Manager.

An important consideration when you are diagnosing issues is communication between VMs deployed by Operations Manager. Communication takes the form of messaging, routing, or both. If either of these go wrong, an installation can fail. For example, after installing TAS for VMs, one of the VMs must deploy a test app to the cloud during post installation testing. The installation fails if the resulting traffic cannot be routed to the HA Proxy load balancer.

## Viewing the debug endpoint

The debug endpoint is a web page that provides diagnostics information. If you have superuser privileges and can view the Tanzu Operations Manager Installation Dashboard, you can access the debug endpoint.

To access the debug endpoint, open the following URL in a web browser:

```
https://OPS-MANAGER-FQDN/debug
```

Where `OPS-MANAGER-FQDN` is the fully-qualified domain name (FQDN) of your Operations Manager installation.

The debug endpoint offers the following links:

- **Files** allows you to view the YAML files that Operations Manager uses to configure products that you install. The most important YAML file, `installation.yml`, provides networking settings and describes `microbosh`. In this case, `microbosh` is the VM whose BOSH Director component is used by Operations Manager to perform installations and updates of TAS for VMs and other products.
- **Components** describes the components in detail.

- **Rails log** shows errors thrown by the VM where the web app, such as a Rails app, is running, as recorded in the `production.log` file.

## Logging tips

### Identifying where to start

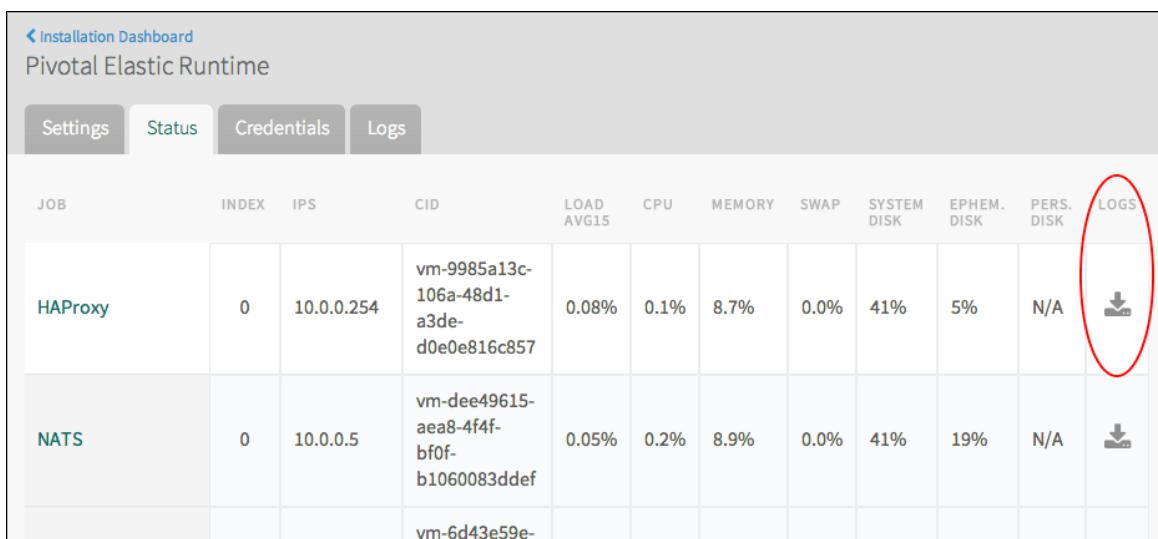
This section contains general tips for locating where a particular problem is called out in the log files. For guidance regarding specific logs, such as those for TAS for VMs components, see the following sections.

- Start with the largest and most recently updated files in the job log.
- Identify logs that contain `err` in the name.
- Scan the file contents for a “failed” or “error” string.

### Viewing logs for TAS for VMs components

To troubleshoot specific TAS for VMs components by viewing their log files:

1. Go to your Operations Manager Installation Dashboard and click the TAS for VMs tile.
2. Select the **Status** tab.
3. In the **Job** column, locate the component that you want to troubleshoot.
4. In the **Logs** column for the component, click the download icon.



Pivotal Elastic Runtime																	
Settings	Status	Credentials	Logs	JOB			INDEX	IPS	CID	LOAD AVG15	CPU	MEMORY	SWAP	SYSTEM DISK	EPHEM. DISK	PERS. DISK	LOGS
									vm-9985a13c-106a-48d1-a3de-d0e0e816c857	0.08%	0.1%	8.7%	0.0%	41%	5%	N/A	
HAProxy	0	10.0.0.254															
NATS	0	10.0.0.5		vm-dee49615-aea8-4f4f-bf0f-b1060083ddef					0.05%	0.2%	8.9%	0.0%	41%	19%	N/A		
				vm-6d43e59e-													

5. Select the **Logs** tab.

FILENAME	UPDATED AT
/tmp/jobs_logs/diego_cell-partition-ee0b66b1415c8591855d-0-150e690af6dd.zip	2016-04-12 19:06:47 UTC
/tmp/jobs_logs/diego_database-partition-ee0b66b1415c8591855d-0-ab7bd3378ef2.zip	2016-04-12 19:09:30 UTC
<b>Downloaded:</b>	
/tmp/jobs_logs/diego_brain-partition-ee0b66b1415c8591855d-0-196edf23631b.zip	2016-04-12 19:09:34 UTC
<b>Pending:</b>	

6. Once the ZIP file corresponding to the component moves to the **Downloaded** list, click the linked file path to download the ZIP file.
7. Once the download completes, unzip the file.

The contents of the log directory vary depending on which component you view. For example, the Diego Cell log directory contains subdirectories for the `metron_agent rep`, `monit`, and `garden` processes. To view the standard error stream for `garden`, download the Diego Cell logs and open `diego.0.job > garden > garden.stderr.log`.

## Viewing web app and BOSH failure logs in a terminal window

You can obtain diagnostic information by logging in to the VM where the BOSH Director job is running. To log in to the BOSH Director VM, you need the following:

- The IP address of the VM shown in the **Settings** tab of the BOSH Director tile.
- Your **import credentials**. Import credentials are the username and password used to import the `.ova` or `.ovf` file into your virtualization system.

To log in to the VM:

1. Open a terminal window.
2. To connect to the BOSH Director VM, run:

```
ssh IMPORT-USERNAME@PCF-VM-IP-ADDRESS
```

Where:

- `IMPORT-USERNAME` is the username you used to import the `.ova` or `.ovf` file into your virtualization system.
- `VM-IP-ADDRESS` is the IP address of the BOSH Director installation VM.

3. Enter your import password when prompted.
4. Go to the home directory of the web app by running:

```
cd /home/tempest-web/tempest/web/
```

5. You are now in a position to explore whether things are as they can be within the web app. You can also verify that the `microbosh` component is successfully installed. A successful MicroBOSH installation is required to install TAS for VMs and any products like databases and messaging services.
6. Go to the BOSH installation log home directory by running:

```
cd /var/tempest/workspaces/default/deployments/micro
```

7. You can begin by running a tail command on the `current` log. Run:

```
cd /var/tempest/workspaces/default/deployments/micro
```

If you cannot resolve an issue by viewing configurations, exploring logs, or reviewing common problems, you can troubleshoot further by running BOSH diagnostic commands with the BOSH Command Line Interface (CLI).



#### Important

Do not manually edit the deployment manifest. Operations Manager overwrites manual changes to this manifest. In addition, manually changing the manifest might cause future deployments to fail.

## Viewing the VMs in your deployment

To view the VMs in your deployment, follow the procedure specific to your IaaS.

### Amazon Web Services (AWS)

To view the VMs in your AWS deployment:

1. Log in to the AWS Console.
2. Go to the EC2 Dashboard.
3. Click **Running Instances**.
4. Click the gear icon in the upper-right corner.
5. Select **job**, **deployment**, **director**, and **index**.
6. Click **Close**.

### OpenStack

To view the VMs in your OpenStack deployment:

1. Install the novaclient from the [python-novaclient](#) repository on GitHub.
2. Point novaclient to your OpenStack installation and tenant by exporting the following environment variables:

```
export OS_AUTH_URL=YOUR_KEYSTONE_AUTH_ENDPOINT
export OS_TENANT_NAME=TENANT_NAME
export OS_USERNAME=USERNAME
export OS_PASSWORD=PASSWORD
```

3. List your VMs by running:

```
nova list --fields metadata
```

## vSphere

To view the VMs in your vSphere deployment:

1. Log in to vCenter.
2. Select **Hosts and Clusters**.
3. Select the top level object that contains your deployment. For example, select **Cluster**, **Datastore**, or **Resource Pool**.
4. In the top tab, click **Related Objects**.
5. Select **Virtual Machines**.
6. Right-click the **Table** heading and select **Show/Hide Columns**.
7. Select the **job**, **deployment**, **director**, and **index** boxes.

## Viewing Apps Manager logs in a terminal window

Apps Manager provides a graphical user interface to help manage organizations, users, apps, and spaces. For more information about Apps Manager, see [Getting Started with Apps Manager](#)

When troubleshooting Apps Manager performance, you can view the Apps Manager app logs.

To view the Apps Manager app logs:

1. From a command line, log in to Operations Manager by running:

```
cf login -a api.YOUR-SYSTEM-DOMAIN -u admin
```

Where `YOUR-SYSTEM-DOMAIN` is your system domain.

When prompted, enter your UAA Administrator credentials. To obtain these credentials, see **Credentials** tab in the TAS for VMs tile.

2. Target the `system` org and the `apps-manager` space by running:

```
cf target -o system -s apps-manager
```

3. Tail the Apps Manager logs by running:

```
cf logs apps-manager
```

## Changing logging levels for Apps Manager

Apps Manager detects the `LOG_LEVEL` environment variable. The `LOG_LEVEL` environment variable allows you to filter the messages reported in Apps Manager log files by severity level. Apps Manager defines severity levels using the Ruby standard library [Logger class](#).

By default, the Apps Manager `LOG_LEVEL` environment variable is set to `info`. The logs show more verbose messaging when you set the `LOG_LEVEL` to `debug`.

To change the Apps Manager `LOG_LEVEL` environment variable, run:

```
cf set-env apps-manager LOG_LEVEL LEVEL
```

Where `LEVEL` is the desired severity level.

You can set `LOG_LEVEL` to one of the six severity levels defined by the Ruby Logger class:

- **Level 5 `unknown`**: An unknown message that should always be logged.
- **Level 4 `fatal`**: An unhandleable error that results in a program failure.
- **Level 3 `error`**: A handleable error condition.
- **Level 2 `warn`**: A warning.
- **Level 1 `info`**: General information about system operation.
- **Level 0 `debug`**: Low-level information for developers.

Once set, Apps Manager log files only include messages at the set severity level and higher. For example, if you set `LOG_LEVEL` to `fatal`, the log only includes `fatal` and `unknown` level messages.

## Analyzing disk usage on containers and Diego Cell VMs

To obtain disk usage statistics by Diego Cell VMs and containers, see [Examining GrootFS Disk Usage](#).

## Troubleshooting slow requests in TAS for VMs

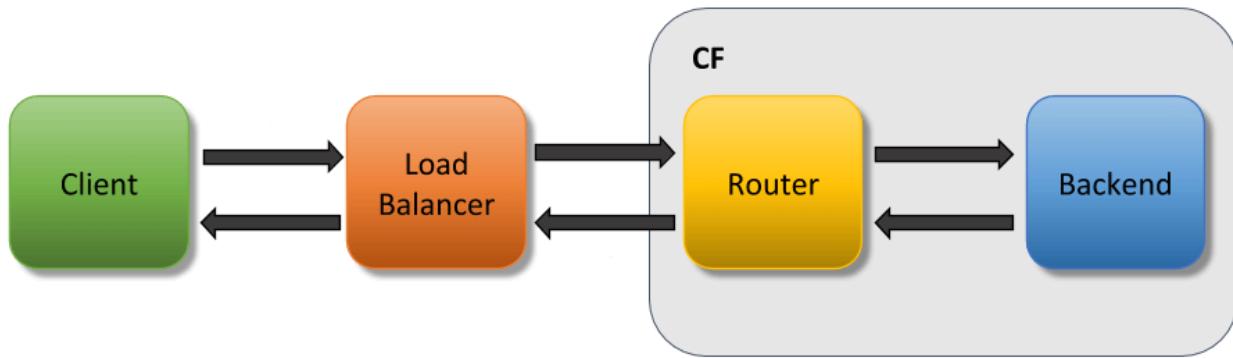
What part of the TAS for VMs request flow adds latency to your requests? Run the experiments in this topic to find out.

TAS for VMs recommends running the procedures in this article in the order presented.

## App requests overview

App requests typically transit the following components. Only the Gorouter and the app are within the scope of VMware Tanzu Application Service for VMs (TAS for VMs).

See the following diagram:



Any of the components in the diagram above can cause latency. Delays can also come from the network itself.

See the sections below for ways to diagnose what might be causing latency to your app requests and then address the issue or investigate further.

## Find the cause of latency

The experiments described below can diagnose the cause of app request latency.

### Experiment 1: Measure total round-trip app requests

To measure the total round-trip time for your deployed app that is experiencing latency, run:

```
time curl -v APP-ENDPOINT
```

Where `APP-ENDPOINT` is the URL endpoint for the deployed app.

For example:

```
$ time curl -v http://appl.app_domain.com

GET /hello HTTP/1.1
Host: appl.app_domain.com
User-Agent: curl/7.43.0
Accept: */*

HTTP/1.1 200 OK
Content-Type: application/json; charset=utf-8
Date: Tue, 14 Dec 2019 00:31:32 GMT
Server: nginx
X-Content-Type-Options: nosniff
X-Vcap-Request-Id: c30fad28-4972-46eb-7da6-9d07dc79b109
Content-Length: 602
hello world!

real 2m0.707s
user 0m0.005s
sys 0m0.007s
```

The `real` time output shows that the request to `http://app1.app_domain.com` took approximately two minutes, round-trip. This seems like an unreasonably long time, so it makes sense to find out where the delay is occurring.

To narrow down the cause of latency, see the following table for information about the output that you see after running `time curl -v APP-ENDPOINT`:

Result	Explanation	Action
The output shows latency.	A component of your app request flow is causing a delay.	Continue with the rest of the experiments to try to narrow down which component is causing latency.
The output does not show latency.	Your app experiences inconsistent delays.	Try to find an endpoint that is consistently experiencing latency. If that is not possible, then continue with the following experiments, running each of them multiple times.
The output shows the error: <code>Could not resolve host:</code> <code>NONEEXISTENT.com</code>	DNS failed to resolve.	Troubleshoot your DNS configuration.
The output of <code>curl</code> returns normally, but there is no value for <code>X-Vcap-Request-Id</code> .	The request from the load balancer did not reach TAS for VMs.	Troubleshoot your load balancer configuration.

## Experiment 2: View request time in access logs

In TAS for VMs, delays can occur within Gorouter, within the app, or within the network between the two. If you suspect that you are experiencing latency, the most important logs are the access logs. The `cf logs` command streams log messages from Gorouter as well as from apps. This section describes how to find and understand the access log timestamps.

To view request time in access logs:

1. (Optional) Run `cf apps` to determine the name of the app.
2. Run:

```
cf logs APP-NAME
```

Where `APP-NAME` is the name of the app.

3. From another command line window, send a request to your app.
4. After your app returns a response, enter `Ctrl-C` to stop streaming `cf logs`.

For example:

```
$ cf logs app1

2019-12-14T00:33:32.35-0800 [RTR/0] OUT app1.app_domain.com - [14/12/20
19:00:31:32.348 +0000] "GET /hello HTTP/1.1" 200 0 60 "-" "HTTPClient/
1.0 (2.7.1, ruby 2.3.3 (2019-11-21))" "10.0.4.207:20810" "10.0.48.67:61
555" x_forwarded_for:"52.3.107.171" x_forwarded_proto:"http" vcap_reque
st_id:"01144146-1e7a-4c77-77ab-49ae3e286fe9" response_time:120.00641734
gorouter_time:0.000217 app_id:"13ee085e-bdf5-4a48-aaaf-e854a8a975df" ap
p_index:"0" x_b3_traceid:"3595985e7c34536a" x_b3_spanid:"3595985e7c3453
```

```
6a" x_b3_parentspanid:"-
2019-12-14T00:32:32.35-0800 [APP/PROC/WEB/0]OUT appl received request a
t [14/12/2019:00:32:32.348 +0000] with "vcap_request_id": "01144146-1e7
a-4c77-77ab-49ae3e286fe9"
^C
```

In the example above, the first line contains the following timestamps:

- 14/12/2016:00:31:32.348: Gorouter receives request
- response\_time:120.00641734: Time measured from when Gorouter receives the request to when Gorouter finishes sending the response to the end user
- gorouter\_time:0.000217: Gorouter response time, not including the time that Gorouter spent sending the request to the back end app or the time waiting for the response from the app.

The `response_time` value shows that it took 120 seconds for Gorouter to send the request to the back end app, receive a response, and send that response to the end user. However, the `gorouter_time` value shows that the Gorouter took 0.000217 seconds to process the request and send the response back to the end user. This means that the bulk of the time was spent in TAS for VMs either within the app, or the network between the Gorouter and the app.

If `gorouter_time` also reported 120 seconds, it would indicate that the time was mostly spent in the Gorouter itself, and relatively little time was spent sending the request to the app.

To narrow down the cause of latency, see the following table for information about the output that you see after running `cf logs APP-NAME`:

Result	Explanation	Action
The output shows latency within <code>gorouter_time</code> .	Gorouter	Investigate gorouter logs as to why the latency is high. Investigate gorouter capacity metrics + possibly scale up
The output shows latency within <code>response_time</code> but not in <code>gorouter_time</code> .	The network between Gorouter and the app, or the app itself, is causing latency. If the requests are uploading data to the app, latency between the client and gorouter may appear here as well	If the issue is not related to uploads, jump to experiment 5, and continue with the rest of the experiments to try to narrow down which component is causing latency. Otherwise continue with experiment 3.
The output does not show latency within <code>response_time</code> .	A component before Gorouter is causing latency to the request before it reaches Gorouter.	Continue with the rest of the experiments to try to narrow down which component is causing latency.
The output does not show a log line.	Every incoming request should generate an access log message. If a request does not generate an access log message, it means Gorouter did not receive the request.	Troubleshoot your Gorouter configuration.

## Experiment 3: Duplicate latency on another endpoint

The next step to debugging latency is finding an endpoint that consistently experiences delays. Use a test app that does not make any internal or external requests or database calls. For example, see [dora](#) on GitHub.

If you cannot push any apps to your foundation, find an API endpoint that does not make any external calls to use for the rest of the experiments. For example, use a health or information endpoint.

To duplicate latency on another endpoint:

1. Push an example app.
2. Measure a request's full round-trip time from the client and back as by running:

```
time curl -v TEST-APP-ENDPOINT
```

Where `TEST-APP-ENDPOINT` is the URL endpoint for the test app. While every network is different, this request should take less than 0.2 seconds.

See the following table for information about the output that you see after running `time curl -v TEST-APP-ENDPOINT`:

Result	Explanation	Action
The output shows latency.	One of the components in the app request path is causing latency.	Continue with the rest of the experiments, using the test app, to try to narrow down which component is causing latency.
The output does not show latency.	Something in your app configuration is causing latency.	Evaluate your app for recent changes.

If this experiment shows that something in your app is causing latency, use the following questions to start troubleshooting your app:

- Did you recently push any changes?
- Does your app make database calls?
  - If so, have your database queries changed?
- Does your app make requests to other microservices?
  - If so, is there a problem in a downstream app?
- Does your app log where it spends time? For more information, see [Use App Logs to Locate Delays in TAS for VMs](#).

## Experiment 4: Remove the load balancer from request path

The next step is to remove the load balancer from the test path by sending the request directly to Gorouter. You can do this by accessing the network where Gorouter is deployed, sending the traffic directly to the Gorouter IP address, and adding the route in the host header.

To remove the load balancer from the request path:

1. Choose a router VM from your deployment and get its IP address. Record this value and use it as the `ROUTER-IP` when you run the command in a later step.
2. Run:

```
bosh ssh router/ROUTER-GUID
```

Where `ROUTER-GUID` is the unique identifier for the router VM. For more information about using this tool, see [Advanced Troubleshooting with the BOSH CLI](#).

- To determine the amount of time a request takes when it skips the load balancer, run:

```
time curl ROUTER-IP -H "Host: TEST-APP-ENDPOINT"
```

Where:

- `ROUTER-IP` is the router VM IP address that you located in the first step.
- `TEST-APP-ENDPOINT` is the URL endpoint for the test app.

See the following table for information about the output that you see after removing the load balancer from the app request path:

Result	Explanation	Action
The output shows latency.	The load balancer is not causing latency.	Continue with the rest of the experiments, using the test app, to try to narrow down which component is causing latency.
The output does not show latency.	A component before Gorouter is causing latency.	Look at your load balancer logs and logs for any other components that exist between the end client and Gorouter. Additionally, run these experiments with clients in different networks to help isolate where issues occur.

## Experiment 5: Remove Gorouter from request path

The next step is to remove Gorouter from the request path. You can SSH into the router VM and send a request directly to the app.

To remove Gorouter from the app request path:

- To retrieve the IP address and port number of the Diego Cell where your test app instance runs, run:

```
cf ssh TEST-APP -c "env | grep CF_INSTANCE_ADDR"
```

Where `TEST-APP` is the name of the test app.

For example:

```
$ cf ssh my-app -c "env | grep CF_INSTANCE_ADDR"
```

- Choose any router VM from your deployment and SSH into it by running:

```
bosh ssh router/ROUTER-GUID
```

Where `ROUTER-GUID` is the unique identifier for the router VM. For more information about using this tool, see [Advanced Troubleshooting with the BOSH CLI](#).

- To determine the amount of time a request takes when it skips Gorouter, run `time curl CF_INSTANCE_ADDR`.

See the following table for information about the output that you see after removing Gorouter from the app request path:

Result	Explanation	Action
The output shows latency.	Gorouter is not causing latency.	Continue with the rest of the experiments, using the test app, to try to narrow down which component is causing latency.
The output does not show latency.	Gorouter is causing latency.	See <a href="#">Causes for Gorouter Latency and Operations Recommendations</a> .

## Experiment 6: Test the network between the router and the app

The next step is to time how long it takes for your request to make it from the router VM to the Diego Cell where your app is deployed. You can do this by using `tcpdump` on both VMs.

To test the network between the router and the app:

1. Choose a router VM from your deployment and record its IP address. Use this value as the `ROUTER-IP` in later steps.
2. To get the IP address of the Diego Cell where your test app instance is running, run `cf ssh TEST-APP -c "env | grep CF_INSTANCE_IP"`, where `TEST-APP` is the name of the test app.
3. To get the port number of the Diego Cell where your test app instance is running, run `cf ssh TEST-APP -c "env | grep CF_INSTANCE_PORT"`, where `TEST-APP` is the name of the test app.
4. On the command line, locate the router VM that matches the `ROUTER-IP` value from the first step.
5. To SSH into the router VM, run `bosh ssh router/ROUTER-GUID`, where `ROUTER-GUID` is the unique identifier for the router VM. For more information about using this tool, see [Advanced Troubleshooting with the BOSH CLI](#).
6. On the router VM, log in as root.
7. To capture all packets going to your app, run `tcpdump 'dst CF_INSTANCE_IP and dst port CF_INSTANCE_PORT'`.
8. In a second command line window, SSH into the Diego Cell that corresponds with `CF_INSTANCE_IP`. Run `bosh ssh diego-cell/DIEGO-CELL-GUID`, where `DIEGO-CELL-GUID` is the unique identifier for the Diego Cell where your app is running.
9. On the Diego Cell, log in as root.
10. To capture all packets going to your app, run `tcpdump 'dst port CF_INSTANCE_PORT and src ROUTER-IP'`, where `ROUTER-IP` is the router VM IP address that you recorded in the first step.
11. In a third command line window, run `ssh ROUTER-IP`, where `ROUTER-IP` is the router VM IP address.
12. To make a request to your app, run `curl CF_INSTANCE_IP:CF_INSTANCE_PORT`.
13. Compare the first packet captured on the router VM with the first packet captured on the Diego Cell. The packets should match. Use the timestamps to determine how long it took the packet to traverse the network.

If you use a test app, this can be the only traffic to your app. If you are not using a test app and there is traffic to your app, then these `tcpdump` commands can result in many packet captures. If the `tcpdump` results are too verbose to track, you can write them to a `pcap` file and use `wireshark`

to find the important packets. To write `tcpdump` commands to a file, use the `-w` flag. For example:

```
tcpdump -w router.pcap.
```

See the following table for information about the output that you see after testing the network between the router and the app:

Result	Explanation	Action
The output shows latency.	Your network is causing latency.	Troubleshoot your network configuration.
The output does not show latency.	A component in your app request path is causing latency.	Repeat the diagnostic experiments to narrow down which component is causing latency. Follow the steps in <a href="#">Experiment 1: Measure Total Round-Trip App Requests</a> and ensure that you are consistently experiencing latency.

## Investigate or address latency

Once you have determined the cause of app request latency, investigate further or address the issue as described in the sections below.

### Use app logs to locate delays in TAS for VMs

To gain a more detailed picture of where delays exist in your request path, augment the logging that your app generates. For example, call your logging library from the request handler to generate log lines when your app receives a request and finishes processing it:

```
2019-12-14T00:33:32.35-0800 [RTR/0] OUT app1.app_domain.com - [14/12/2019:00:31:32.348 +0000] "GET /hello HTTP/1.1" 200 0 60 "-" "HTTPClient/1.0 (2.7.1, ruby 2.3.3 (2019-11-21))" "10.0.4.207:20810" "10.0.48.67:61555" x_forwarded_for:"52.3.107.171" x_forwarded_proto:"http" vcap_request_id:"01144146-1e7a-4c77-77ab-49ae3e286fe9" response_time:120.00641734 app_id:"13ee085e-bdf5-4a48-aaa f-e854a8a975df" app_index:"0" x_b3_traceid:"3595985e7c34536a" x_b3_spanid:"35 95985e7c34536a" x_b3_parentspanid:"-"
2019-12-14T00:32:32.35-0800 [APP/PROC/WEB/0]OUT app1 received request at [14/12/2019:00:32:32.348 +0000] with "vcap_request_id": "01144146-1e7a-4c77-77ab-49ae3e286fe9"
2019-12-14T00:32:32.50-0800 [APP/PROC/WEB/0]OUT app1 finished processing req at [14/12/2019:00:32:32.500 +0000] with "vcap_request_id": "01144146-1e7a-4c77-77ab-49ae3e286fe9"
```

By comparing the router access log messages from [Experiment 2: View Request Time in Access Logs](#) with the new app logs above, you can construct the following timeline:

- `14/12/2016:00:31:32.348`: Gorouter receives request
- `2016-12-14T00:32:32.35`: App receives request
- `2016-12-14T00:32:32.50`: App finishes processing request
- `2016-12-14T00:33:32.35`: Gorouter finishes processing request

The timeline indicates that Gorouter took close to 60 seconds to send the request to the app and another 60 seconds to receive the response from the app. This suggests either of the following:

- A delay with Gorouter. See [Causes for Gorouter Latency](#).
- Network latency between Gorouter and the Diego Cells that host the app.

## Causes for Gorouter latency

Two potential causes for Gorouter latency are:

- Routers are under heavy load from incoming client requests.
- Apps are taking a long time to process requests. This increases the number of concurrent threads held open by Gorouter, reducing capacity to handle requests for other apps.

## Operations recommendations

- Monitor CPU load for Gorouters. At high CPU (70%+), latency increases. If the Gorouter CPU reaches this threshold, consider adding another Gorouter instance.
- Monitor latency of all routers using metrics from the Firehose. Do not monitor the average latency across all routers. Instead, monitor them individually on the same graph.
- Consider using Pingdom against an app on your TAS for VMs deployment to monitor latency and uptime. For more information, see the [Pingdom](#) website.
- Consider enabling access logs on your load balancer. To enable access logs, see your load balancer documentation. Just as you use Gorouter access log messages above to determine latency from Gorouter, you can compare load balancer logs to identify latency between the load balancer and Gorouter. You can also compare load balancer response times with the client response times to identify latency between client and load balancer.
- Deploy a nozzle to the Loggregator Firehose to track metrics for Gorouter. For more information, see [Deploying a Nozzle to the Loggregator Firehose](#). Available metrics include:
  - CPU utilization
  - Latency
  - Requests per second

## Troubleshooting TCP routing in TAS for VMs

Are your TCP routing issues related to DNS and load balancer misconfiguration, the TCP routing tier, or the routing subsystem? Use the following steps to find out.

### Rule out the app

If you are have TCP routing issues with an app, the following procedure determines what to troubleshoot:



If you have mutual TLS app identity verification enabled, app containers accept incoming communication only from the Gorouter. This deactivates TCP routing. For more information, see [TLS to Apps and Other Back End Services in HTTP Routing](#).

### Prerequisites

This procedure requires that you have the following:

- An app with TCP routing issues.
- A TCP domain. See [Routes and Domains](#) for more information about creating a TCP domain.
- A simple HTTP web app that you can use to curl.

## Procedure

1. Push a simple HTTP app using your TCP domain (cf CLI v6 only) by entering the following command:

```
$ cf push MY-APP -d tcp.MY-DOMAIN --random-route
```

For cf CLI v7 and later, the `-d` flag is not supported. Domain is set in the manifest, in the `routes` property.

```
$ cf push MY-APP --random-route
```

2. Curl your app on the port generated for the route. For example, if the port is 1024:

```
$ curl tcp.MY-DOMAIN:1024
```

3. If the curl request fails to reach the app, proceed to the next section: [Rule Out DNS and the Load Balancer](#).
4. If the curl request to your simple app succeeds, curl the app you are having issues with.
5. If you cannot successfully curl your problem app, TCP routing is working correctly. There is an issue with the app you cannot successfully curl.

## Rule out DNS and the load balancer

1. Curl the TCP router healthcheck endpoint:

```
$ curl tcp.MY-DOMAIN:80/health -v
```

2. If you receive a `200 OK` response, proceed to the next section: [Rule Out the Routing Subsystem](#).
3. If you do not receive a `200 OK`, your load balancer might not be configured to pass through the healthcheck port. Continue following this procedure to test your load balancer configuration.
4. Confirm that your TCP domain name resolves to your load balancer:

```
$ dig tcp.MY-DOMAIN
...
tcp.MY-DOMAIN. 300 IN A 123.456.789.123
```

5. As an admin user, list the reservable ports configured for the `default-tcp` router group:

```
$ cf curl /routing/v1/router_groups
[
  {
```

```

        "guid": "d9b1db52-ea78-4bb9-7473-ec8e5d411b14",
        "name": "default-tcp",
        "type": "tcp",
        "reservable_ports": "1024-1123"
    }
]

```

- Choose a port from the `reservable_ports` range and curl the TCP domain on this port. For example, if you chose port 1024:

```
$ curl tcp.MY-DOMAIN:1024 -v
```

- If you receive an immediate rejection, then the TCP router likely rejected the request because there is no route for this port.
- If your connection times out, then you need to configure your load balancer to route all ports in `reservable_ports` to the TCP routers.

## Rule out the routing subsystem

Send a direct request to the TCP router to confirm that it routes to your app.

- SSH into your TCP router.
- Curl the port of your route using the IP address of the router itself. For example, if the port reserved for your route is 1024, and the IP address of the TCP router is 10.0.16.18:

```
$ curl 10.0.16.18:1024
```

- If the curl is successful, then the load balancer either:
  - cannot reach the TCP routers, or
  - is not configured to route requests to the TCP routers from the `reservable_ports`
- If you cannot reach the app by curling the TCP router directly, perform the following steps to confirm that your TCP route is in the routing table.
  - Record the **Tcp Emitter Credentials** from the **UAA** row in the TAS for VMs **Credentials** tab. This OAuth client has permissions to read the routing table.
  - Install the UAA CLI `uaac`:

```
$ gem install cf-uaac
```

- Obtain a token for this OAuth client from UAA by providing the client secret:

```
$ uaac token client get tcp_emitter
Client secret:
```

- Obtain an `access_token`:

```
$ uaac context
```

5. Use the [routing API](#) to list TCP routes:

```
$ curl api.MY-DOMAIN/routing/v1/tcp_routes -H "Authorization: bearer TOKEN"
[{"router_group_guid":"f3518f7d-d8a0-4279-4e89-c058040d0000",
"backend_port":60000,"backend_ip":"10.244.00.0","port":60000,"modification_tag":{"guid":"d4cc3bbe-c838-4857-7360-19f034440000",
"index":1},"ttl":120}]
```

6. In this output, each route mapping has the following:
  - port**: your route port
  - backend\_ip**: an app instance mapped to the route
  - backend\_port**: the port number for the app instance mapped to the route
7. If your route port is not in the response, then the `tcp_emitter` might be unable to register TCP routes with the routing API. Look at the logs for `tcp_emitter` to see if there are any errors or failures.
8. If the route is in the response, but you were not able to curl the port on the TCP route directly, then the TCP router might be unable to reach the routing API. Look at the logs for `tcp_router` to see if there are any errors or failures.

## Troubleshooting router error responses in TAS for VMs

Are your 502 errors the result of your infrastructure, TAS for VMs, or an app? This topic helps you understand and debug these errors.

### Outer error responses overview

In your deployment, 502 errors can come from any of the following:

- **Infrastructure**: issues with your load balancer or network can cause 502 errors.
- **Platform**: issues with Gorouter or Diego Cells can cause 502 errors. See the following sections:
  - [Diagnose Gorouter Errors](#)
  - [Diagnose Stale Routes in Gorouter](#)
  - [Gorouter Error Classification Table](#)
- **App**: issues with an app's load or configuration can cause 502 errors. See [Diagnose App Errors](#).

If you are unsure of the source of 502 errors, see [General Debugging Steps](#).

### General debugging steps

Some general debugging steps for any issue resulting in 502 errors are as follows:

1. Gather the Gorouter logs and Diego Cell logs at the time of the incident. To SSH into the router VM, see [Advanced Troubleshooting with the BOSH CLI](#). To download the router VM logs from Tanzu Operations Manager, see [Monitoring VMs](#).
2. Review the logs and consider the following:

1. Which errors are the Gorouters returning?
  2. Is Gorouter's routing table accurate? Are the endpoints for the route as expected? For more information, see [Dynamic Routing Table](#) in the Gorouter documentation on GitHub.
  3. Do the Diego Cell logs have anything interesting about unexpected app crashes or restarts?
  4. Is the app healthy and handling requests successfully? You can use request tracing headers to verify. For more information, see [HTTP Headers for Zipkin Tracing](#) in *HTTP Routing*.
3. Consider the following:
- Does your load balancer log 502 errors, but Gorouter does not? This means that traffic is not reaching Gorouter.
  - Was there a recent platform change or upgrade that caused an increase in 502 errors?
  - Are there any suspicious [metrics](#) spiking? How is the CPU and memory utilization?

## Log formatting

### Levels

The following table describes the log levels supported by Gorouter. The log level is set to `debug` and is not configurable.

Message	Description	Examples
<code>fatal</code>	Gorouter is unable to handle any requests due to a fatal error.	Gorouter cannot bind to its TCP port, a TAS for VMs component has published invalid data to Gorouter.
<code>error</code>	An unexpected error has occurred.	Gorouter failed to fetch token from UAA service.
<code>info</code>	An expected event has occurred.	Gorouter started or exited, Gorouter has begun to prune routes for stale droplets.
<code>debug</code>	A lower-level event has occurred.	Route registration, route unregistration.

### Message contents

This section provides a sample Gorouter log entry and explanation of the contents.

```
[2017-02-01 22:54:08+0000]
{"log_level":0,"timestamp":1485989648.0895808,"message":"endpoint-
registered","source":"vcap.Gorouter.registry","data":{"uri":"0-*.
login.bosh-
lite.com","backend":"10.123.0.134:8080","modification_tag":{"guid":"","index":0}}}
```

Property	Description
<code>log_level</code>	Logging level of the message
<code>timestamp</code>	Epoch time of the log
<code>message</code>	Content of the log entry
<code>source</code>	Gorouter function that initiated the log entry

Property	Description
data	Additional information that varies based on the message

## Access logs

This section provides details about Gorouter access logs.

Gorouter generates an access log in the following format when it receives a request:

```
<Request Host> - [<Start Date>] "<Request Method> <Request URL> <Request Protocol>"<Status Code> <Bytes Received> <Bytes Sent> "<Referrer>" "<User-Agent>" <Remote Address><Backend Address> x_forwarded_for:<X-Forwarded-For> x_forwarded_proto:<X-Forwarded-Proto> vcap_request_id:<X-Vcap-Request-ID> response_time:<Response Time> gorouter_time:<Gorouter Time> app_id:<Application ID> app_index:<Application Index> x_cf_routererror:<X-Cf-RouterError> <Extra Headers>
```

Gorouter access logs are also redirected to syslog.

See the following list for more information about the Gorouter access log fields:

- The following are optional fields: `Status Code`, `Response Time`, `Application ID`, `Application Index`, `X-Cf-RouterError`, and `Extra Headers`.
- If the access log lacks a `Status Code`, `Response Time`, `Application ID`, `Application Index`, or `X-Cf-RouterError`, the corresponding field shows `-`.
- `Response Time` is the total time it takes for the request to go through the Gorouter to the app and for the response to travel back through the Gorouter. This has the time that the request spends traversing the network to the app and back again to the Gorouter. It also has the time the app spends forming a response.
- `Gorouter Time` is the total time it takes for the request to go through the Gorouter initially plus the time it takes for the response to travel back through the Gorouter. This does not have the time the request spends traversing the network to the app. This also does not have the time the app spends forming a response.
- `X-Cf-RouterError` is populated if the Gorouter encounters an error. The returned values can help distinguish whether a non 2xx response code is due to an error in the Gorouter or the back end. For more information on the possible errors, see the [Diagnose App Errors](#) section.

## Diagnose Gorouter errors

This section describes the basic structure of Gorouter logs and how to diagnose Gorouter errors.

### Gorouter cannot connect to the app container

If Gorouter cannot connect to the app container, you might see this error in the `gorouter.log`:

```
[2018-07-05 17:59:10+0000] {"log_level":3,"timestamp":1530813550.92134,"message": "backend-endpoint-failed","source":"vcap.gorouter","data":{"route-endpoint":{"ApplicationId":"","Addr":"10.0.32.15:60099","Tags":null,"RouteServiceUr
```

```
l":""},  
"error":"dial tcp 10.0.32.15:60099: getsockopt: connection refused"}}
```

If TCP cannot make an initial connection to the backend, Gorouter retries TCP dial errors up to `max_attempts` which defaults to 3. If it still fails, Gorouter returns a 502 to the client and writes to the `access.log`.

Any of the following can cause connection errors between Gorouter and the app container:

- An app that is unresponsive, indicates an issue with the app.
- A stale route in Gorouter, indicates an issue with the platform. For more information, see [Diagnose Stale Routes](#).
- A corrupted app container, indicates a problem with the platform.

## Gorouter errors after connecting

If Gorouter successfully dials the endpoint but an error occurs, you might see the following:

- `read: connection reset by peer` errors. When these errors occur, the Gorouter returns error to the client, marks backend ineligible, and does not retry another back end.
  - Only for idempotent requests and if `route-integrity` is enabled:

If a TCP connection can be established (with Envoy), but the app itself does not send a complete http response, Gorouter retries the request on different app instances if any exist.

A request is considered idempotent under the following circumstances (see also [Gorouter source code](#)):

Request body is empty AND (Request method is one of “GET”, “HEAD”, “OPTIONS”, “TRACE” OR Request Header `X-Idempotency-Key` or `Idempotency-Key` is set)

The most likely scenario for this to occur is during creation of a new app instance, while the app is not yet completely started, but Envoy is already accepting connections.

- TLS handshake errors. When these errors occur, the Gorouter retries up to `max_attempts` which defaults to 3. If it still fails, Gorouter can return a 502. These errors appear similar to the following in the `gorouter.log`, and a 502 error is logged in the `access.log`:

```
[2018-07-05 18:20:54+0000] {"log_level":3,"timestamp":1530814854.435983  
4,"message":  
"backend-endpoint-failed","source":"vcap.gorouter","data":{"route-endpoi  
nt":  
{"ApplicationId":"","Addr":"10.0.16.17:61002","Tags":null,"RouteService  
Url":""},  
"error":"x509:certificate is valid for 53079ca3-c4fe-4910-78b9-cla6, no  
t xxx"}}
```

- If a client cancels a request before the server responds with headers, Gorouter returns a 499 error.

## Diagnose stale routes in Gorouter

A stale route occurs when Gorouter contains out-of-date route information for a backend app. In nearly all cases, stale routes are self correcting.

When Gorouter detects that it is sending traffic to the wrong app, it prunes that backend app from its route table and terminates the connection.

## Causes of stale routes

When a route is unmapped or when an app container is deleted because the app is deleted or moved, a deregister message is sent to Gorouter. This message tells Gorouter to delete the route mapping to that container.

If Gorouter does not receive this deregister message, the route is now considered stale. Gorouter still attempts to send traffic to the app.

You are more likely to have stale routes when the following are true:

- SSL verification is not activated.
- You are on one of the versions of TAS for VMs that does not send deregister messages multiple times. For the list of versions, see [Enabling TLS from the Gorouter to application instances results in bad routes in TAS for VMs 2.3+](#) in the Knowledge Base.
- You unmapped a route to an app, but traffic to that route is still being sent to the app.

## How to locate stale routes

The following procedure helps you identify stale routes:

1. **Verify the state of the deployment.** Run `cf routes` for all spaces and ensure the route is only mapped to the intended apps. Sometimes there can be multiple routes using the same hostname and domain, but with different paths. If the domain is shared, check all orgs as well.
2. **Examine the Gorouter routes table.** It might be necessary to check multiple Gorouters, as it is possible that some received the proper deregister message and some did not.
  1. SSH to the VM where Gorouter is running.
  2. To print the entire Gorouter routes table, run: `/var/vcap/jobs/gorouter/bin/retrieve-local-routes | jq .`
  3. Find the entry for the suspected stale route. Note the values for `address` and `private_instance_id`.
3. **Cross-reference the Gorouter routes table entry with actual Long-Running Processes (LRPs):**
  1. SSH onto the Diego Cell where the IP address matches the IP address that you found on the routes table entry.
  2. To get information about all of the actual LRPs, run: `cf dot actual-lrps | jq .`
  3. Look through the actual LRPs to find the instance ID that you noted from the routes table. If that instance ID exists and the port in the route table does not exist in the ports section, then there is likely a stale route.



The CAPI endpoint `GET /v3/processes/:guid/stats` provides information about the host and ports the app is using, and is intended for use by app developers.

This endpoint does not provide complete information for operators. Operators should use the `cf dot` CLI on the Diego Cell to view the LRPs directly and all at once.

## How to fix stale routes

In most cases, you do not have to fix stale routes. Stale routes are normal in the routing table.

Gorouter fixes stale routes on its own when SSL verification is activated. When Gorouter attempts to send traffic to a stale endpoint, it recognizes that the endpoint is stale. Gorouter prunes the stale route and then tries another endpoint. Stale routes are only a problem if an end user receives errors.

The following procedure helps you fix stale routes:

1. Ensure that SSL verification is activated. For more information, see [With TLS Enabled in HTTP Routing](#).



Using TLS to verify app identity depends on SSL verification. If you deactivate SSL verification, there is no way to avoid misrouting.

2. If there is a stale route, then restarting Gorouter fixes the immediate issue. If you restart all of the Gorouters, and see the same issue for the exact same route, then the issue is not a stale route. The issue is that a bad route is continuing to be added to the route table no matter how many time Gorouter prunes it.
3. If Gorouter is continually missing deregister messages, it might be because either the NATS message bus or the Gorouters are overwhelmed. Look at the VM usage and consider scaling.

## Gorouter error classification table

Use this table when you are debugging Gorouter errors. The table lists error types, status codes, and indicates if the Gorouter retries the errored request.

For each error, a `backend-endpoint-failure` log entry appears in `gorouter.log` and an error message in `gorouter.err.log`. Additionally, the `access.log` records the request status codes. For more information about debugging Gorouter errors, see the [Gorouter documentation](#) on GitHub.

If the request is one that can be retried, Gorouter makes up to `max_attempts` which defaults to 3.

Error Type	Status Code	Can be re-tried?	Source of Issue	Evidence
Dial	502	Yes	App or Platform	Logs with error <code>dial tcp</code>
AttemptedTLSWithNonTLSBackend	525	Yes	Platform	Logs with error <code>tls: first record does not look like a TLS handshake or backend_tls_handshake_failed metric increments</code>
HostnameMismatch	503	Yes	Platform	Logs with error <code>x509: certificate is valid for &lt; x &gt;, not &lt; y &gt;</code> or <code>backend_invalid_id metric increments</code>

Error Type	Status Code	Can be re-tried?	Source of Issue	Evidence
UntrustedCert	526	Yes	Platform	Logs with error prefix <code>x509: certificate signed by unknown authority</code> or <code>backend_invalid_tls_cert</code> metric increments
RemoteFailedCertCheck	496	Yes	Platform	Logs with error remote <code>error: tls: bad certificate</code>
ContextCancelled	499	No	Client/App	Logs with error <code>context canceled</code> This status code appears in logs only. It is never returned to clients as it occurs when the downstream client closes the connection before Gorouter responds.
RemoteHandshakeFailure	525	Yes	Platform	Logs with error remote <code>error: tls: handshake failure</code> and <code>backend_tls_handshake_failed</code> metric increments
ExpiredOrNotYetValidCertFailure	502	Yes	Platform	Logs with error <code>x509: certificate has expired or is not yet valid</code> . For example, this error can occur if the Diego Cell clock drifts.
unknown	502	No	App or Platform	If the error is not one of the types mentioned earlier, then <code>502</code> is the default response. Gorouter tracks <code>502</code> errors with the <code>gorouter.bad_gateways</code> metric. See <a href="#">Router Error: 502 Bad Gateway</a> .

## Diagnose app errors

This section describes app-related 502 errors.

When 502 errors only occur in specific app instances and not all app instances on the platform, it is likely an app-related error. The app might be overloaded, unresponsive, or unable to connect to the database.

When all apps are experiencing 502 errors, then it could either be a platform issue. For example, a misconfiguration, or an app issue likely all apps being unable to connect to an upstream database.

If the Gorouter has back end keep-alive connections activated, 502 errors can occur due to a race condition when the app instance keep alive idle timeout is less than 90 seconds. For more information, see [Gorouter Back End Keep-Alive Connections](#).

For any other errors that appear in Gorouter access logs, you can analyze application logs if they need further investigation.

Gorouter does not retry any error response returned by the app.

## Gorouter specific response headers

In the case that Gorouter encounters an error connecting to an application backend, the `X-CF-RouterError` header is populated to help distinguish the origin of a non-2xx response code.

The value of the `X-CF-RouterError` header can be one of the following:

Value	Description
invalid_cf_app_instance_header	The provided value for the <code>X-Cf-App-Instance</code> header does not match the required format of <code>APP_GUID:INSTANCE_ID</code> .
empty_host	The value for the <code>Host</code> header is empty, or the <code>Host</code> header is equivalent to the remote address. Some LB's optimistically set the <code>Host</code> header value with their IP address when there is no value present.
unknown_route	The desired route does not exist in the gorouter's route table.
no_endpoints	The entry is in the route table for the desired route, but there are no healthy endpoints available.
Connection Limit Reached	The backends associated with the route have reached their max number of connections. The max connection number is set via the spec property <code>router.backends.max_conns</code> .
route_service_unsupported	Route services are not enabled or WebSockets requests are bound to route services. You can configure route services using the spec property <code>router.route_services_secret</code> . If the property is empty, route services are deactivated.
endpoint_failure	The registered endpoint for the desired route failed to handle the request.

## Troubleshooting VMware Tanzu Operations Manager on GCP

You can troubleshoot known issues when deploying Operations Manager on Google Cloud Platform (GCP).

### Problems connecting with single sign-on (SSO) for VMware Tanzu

You might be unable to connect to applications running on Operations Manager using SSO for VMware Tanzu.

#### Explanation

SSO for VMware Tanzu does not support multi-subnets.

#### Solution

Ensure that you have configured only one subnet. See [Preparing to deploy Tanzu Operations Manager on GCP](#).

### Uploading TAS for VMs tile causes Operations Manager rails application crash

Uploading the VMware Tanzu Application Service for VMs (TAS for VMs) tile causes the Operations Manager Rails application to crash.

#### Explanation

In compressed format, the TAS for VMs tile is 5 GB in size. However, when uncompressed during installation, the TAS for VMs tile requires additional disk space that can exhaust the space allocated to the

boot disk.

## Solution

Ensure that the boot disk is allocated at least 50 GB of space. See [Create the Operations Manager VM Instance in Deploying Tanzu Operations Manager on GCP](#).

## TAS for VMs deployment fails - MySQL Monitor replication-canary job

During installation of the TAS for VMs tile, the replication-canary job fails to start. The error reported in the installation log resembles the following:

```
Started updating job mysql_monitor > mysql_monitor/0
(48e7ec82-3cdf-41af-9d0f-90d1f12683c8) (canary). Failed: 'mysql_monitor/0
(48e7ec82-3cdf-41af-9d0f-90d1f12683c8)' is not running after update.
Review logs for failed jobs: replication-canary (00:05:13)

Error 400007: 'mysql_monitor/0 (48e7ec82-3cdf-41af-9d0f-90d1f12683c8)'
is not running after update.
Review logs for failed jobs: replication-canary
```

## Explanation

This error can appear as a result of incorrect configuration of network traffic and missed communication between the Gorouter and a load balancer.

## Solution

1. Make sure you have selected the **Forward SSL to TAS for VMs Router** option in your [TAS for VMs Network Configuration](#).
2. Verify that you have configured the firewall rules properly and that TCP ports [80](#), [443](#), [2222](#), and [8080](#) are accessible on your GCP load balancers. See [Create Firewall Rules for the Network](#) in [Preparing to deploy Tanzu Operations Manager on GCP](#).
3. Verify that you have configured the proper SSL certificates on your HTTP(S) load balancer in GCP. See [Create HTTP load balancer](#) in [Preparing to deploy Tanzu Operations Manager on GCP](#).
4. If necessary, upload a new certificate again and update any required SSL Certificate and SSH Key fields in your [TAS for VMs Network Configuration](#).

## Insufficient external database permissions

Upgrade issues can be caused when the external database user used for the network policy DB is given insufficient permissions. To avoid this upgrade issue, ensure that the `networkpolicyserver` database user has the [ALL PRIVILEGES](#) permission.

# Checking Tanzu Operations Manager after a power failure on vSphere

Learn how to check the state of Operations Manager after a power failure in an on premises vSphere installation.

If you have a procedure at your company for handling power failure scenarios and want to add steps for checking the state of Operations Manager, use this procedure as a template.

## Automatic recovery process

When power returns after a failure, vSphere and Operations Manager automatically do the following to recover your environment:

1. vSphere High Availability (HA) recovers VMs.
2. BOSH ensures that the processes on those VMs are healthy, with the exception of the Operations Manager VM and the BOSH VM itself. Operations Manager uses BOSH to deploy and manage its VMs. For more information, see the [BOSH documentation](#).
3. The Diego runtime of VMware Tanzu Application Service for VMs (TAS for VMs) recovers apps that were running on the VMs. For more information, see [Diego Components and Architecture](#).

## Scenarios that require manual intervention

You might require manual intervention when recovering your environment after a power failure:

- If TAS for VMs is configured to use a MySQL cluster instead of a single node, the cluster does not recover automatically.

The procedure in this topic includes more detail about addressing these scenarios.

## Checklist

Use the checklist in this section to ensure that Operations Manager is in a good state after a power failure.

This checklist assumes that your Operations Manager on vSphere installation is configured for vSphere HA and that you have the BOSH Resurrector activated.

Phase	Component	Action
1	vSphere	<a href="#">Ensure vSphere is running</a>
2	Operations Manager	<a href="#">Ensure Operations Manager is running</a>
3	BOSH Director	<a href="#">Ensure BOSH Director is running</a>
4	BOSH Director	<a href="#">Ensure BOSH Resurrector finished recovering</a>
5	TAS for VMs	<a href="#">Ensure VMs for TAS for VMs are running</a> . This might include manually recovering the MySQL cluster.
6	TAS for VMs	<a href="#">Ensure apps hosted on TAS for VMs are running</a>
7	Operations Manager Healthwatch	<a href="#">Check the Healthwatch Dashboard</a>

## Phase 1: Ensure vSphere is running

Ensure that vSphere is running and has fully recovered from the power failure. Check your internal vSphere monitoring dashboard.

## Phase 2: Ensure Operations Manager is running

To ensure that Operations Manager is running, do the following:

1. Open vCenter and go to the resource pool that hosts your Operations Manager deployment.
2. Select the **Related Objects > Virtual Machines**.
3. Locate the VM with the name `OpsMan-VERSION`, for example `OpsMan-2.6`.
4. Review the **State** and **Status** columns for the Operations Manager VM. If Operations Manager is running, the columns show **Powered On** and **Normal**. If the columns do not show **Powered On** and **Normal**, restart the VM.

## Phase 3: Ensure BOSH Director is running

To ensure that BOSH Director is running, do the following:

1. In a browser, go to Operations Manager UI and select the **BOSH Director for vSphere** tile. If you do not know the URL of the Operations Manager VM, you can use the IP address that you obtain from vCenter.
2. Select **Status**.
3. In the **BOSH Director** row, locate and record the **CID**. The CID is the cloud ID and corresponds to the VM name in vSphere.
4. Go to the vCenter resource pool or cluster that hosts your Operations Manager deployment.
5. Select **Related Objects > Virtual Machines**.
6. Locate the VM with the name that corresponds to the **CID** value that you copied.
7. Review the **State** and **Status** columns for the VM. If the **State** column does not show **Powered On**, restart the VM.
8. If the **State** column shows that the VM is **Powered On** but the **Status** column does not show **Normal**, try the following:
  1. SSH into the BOSH Director VM using the instructions in [SSH into the BOSH Director VM](#).
  2. Run the following command to see that all processes are running:

```
monit summary
```

3. If the `uaa` process is not running, run the following command:

```
monit restart UAA
```

## Phase 4: Ensure BOSH Resurrector finished recovering

If activated, the BOSH Resurrector recreates any VMs in a problematic state after being recovered by vSphere HA.

To ensure BOSH Resurrector finished recovering, do the following:

1. Log in to the Operations Manager VM with SSH using the instructions in [Log in to the Operations Manager VM with SSH](#).
2. Authenticate with the BOSH Director VM using the instructions in [Authenticate with the BOSH Director VM](#).
3. Run the following command to see if there is any currently running or queued Resurrector activity:

```
bosh tasks --all -d ''
```

Review the task description for `scan` and `fix`. If no tasks are running, the BOSH Director has probably finished recovering. Run `bosh tasks --recent --all -d ''` to view finished tasks.

## Phase 5: Ensure the VMs for TAS for VMs are running

You can also apply the steps in this section to any Operations Manager services. To further ensure the health of Operations Manager services, use the Operations Manager Healthwatch dashboard and the documentation for each service.

To ensure that the VMs for TAS for VMs are running, do the following:

1. Run the following command to confirm that VMs are running:

```
bosh vms
```

BOSH lists VMs by deployment. The deployment with the `cf-` prefix is the TAS for VMs deployment.

2. If the `mysql` VM is not running, it is likely because it is a cluster and not a single node. Clusters require manual intervention after an outage. For instructions to confirm and recover the cluster, see [Manually Recover MySQL \(Clusters Only\)](#).
3. If any other VMs are not running, run the following command:

```
bosh cck -d DEPLOYMENT
```

This command scans for problems and provides options for recovering VMs. For more information, see [IaaS Reconciliation](#) in the BOSH documentation.

4. If you cannot get all VMs running, contact [Broadcom Support](#) for assistance. Provide the following information:
5. You have started this checklist to recover from a power failure on vSphere.
6. A list of failing VMs.
7. Your Operations Manager version.

## Manually recover MySQL (clusters only)

To manually recover MySQL, do the following:

1. In a browser, go to Operations Manager UI and select the **VMware Tanzu Application Service for VMs** tile.
2. Select the **Resource Config** pane.
3. Review the **INSTANCES** column of the **MySQL Server** job. If the number of instances is greater than [1](#), manually recover MySQL by following [Recovering From MySQL Cluster Downtime](#).

## Phase 7: Ensure apps hosted on TAS for VMs are running

To ensure apps hosted on TAS for VMs are running, do the following:

1. Check the status of an app that you run on Operations Manager. Run any health checks that the app has or visit the URL of the app to verify that it is working.
2. Push an app to Operations Manager.

## Phase 8: Check the Healthwatch dashboard

You can use Operations Manager Healthwatch to further assess the state of Operations Manager. For more information, see [Using Operations Manager Healthwatch](#).

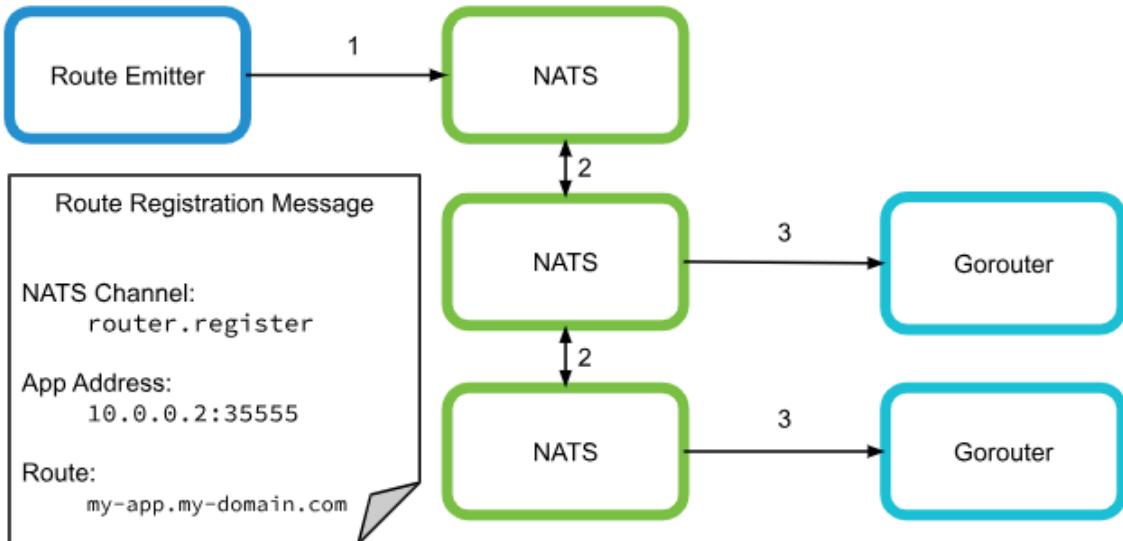
## Troubleshooting NATS Split Brain Issues with NATS Monitor

NATS is an in-memory message bus that is used as part of the [routing architecture](#) of VMware Tanzu Application Service for VMs (TAS for VMs). Clients can send messages on NATS channels and clients can subscribe to NATS channels.

The table shows some common uses for NATS in TAS for VMs.

<b>Message Publishing Client</b>	<b>Message Subscribing Client</b>	<b>Message Contents</b>
Route Emitter	Gorouter	HTTP app route registrations and unregistrations
Route Emitter	Service Discovery Controller	Internal app route registrations and unregistrations
Route Registrar	Gorouter	HTTP component routes, like api.SYSTEM_DOMAIN for cloud controller

This graphic shows an example of how NATS is used in routing architecture.



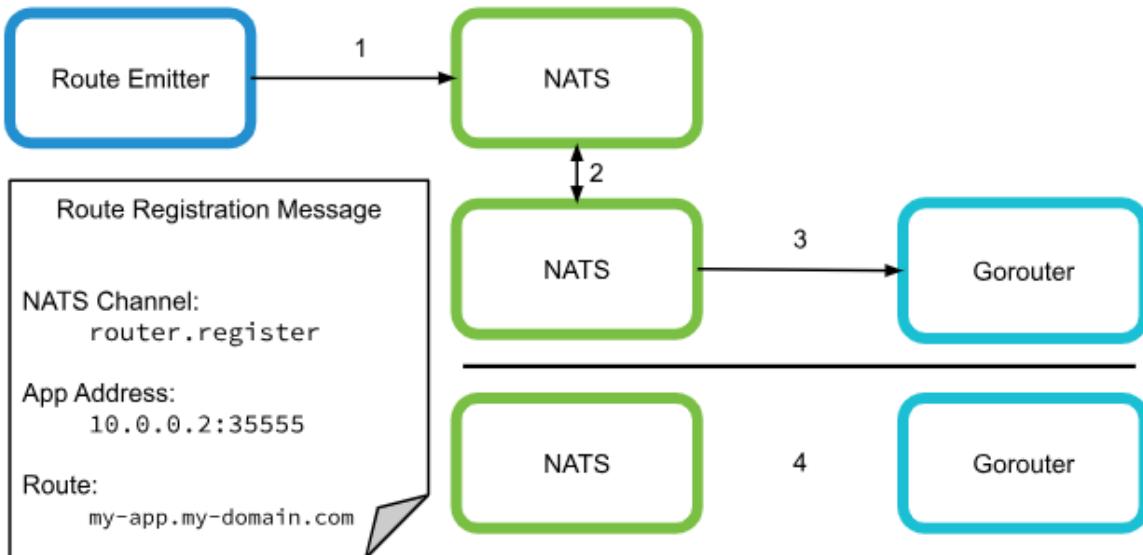
What follows is a description of the steps shown in the graphic:

1. Route Emitter is connected to one of the NATS servers. It publishes a route message to the `router-register` channel.
2. The NATS servers are all in a cluster. This means that any message published to one is sent to all NATS servers.
3. Each Gorouter is connected to one of the NATS servers and is subscribed to the `router-register` channel. Each Gorouter receives the route registration message.

## What is a NATS split brain and why is it bad?

A split brain is what happens when all the NATS servers don't talk to each other properly. This means that messages published to one NATS server are not replicated across the entire NATS cluster, which means not all subscribers get the message. This is bad. For example, this means that route registration messages are not sent to all Gorouters. This can result in 404s for the end user.

The following graphic shows an example of a NATS split brain and why it is bad.



1. Route Emitter is connected to one of the NATS Servers. It publishes a route message to the `route-register` channel.
2. The NATS servers are supposed to be a cluster, but there is a split brain, so not all NATS servers are communicating with each other. Only some NATS servers learn about the registration message.
3. One of the Gorouters receives the route registration message.
4. One of the Gorouters does not receive the route registration message.

## NATS Monitor

NATS Monitor detects and fixes NATS split brains.

### NATS Monitor:

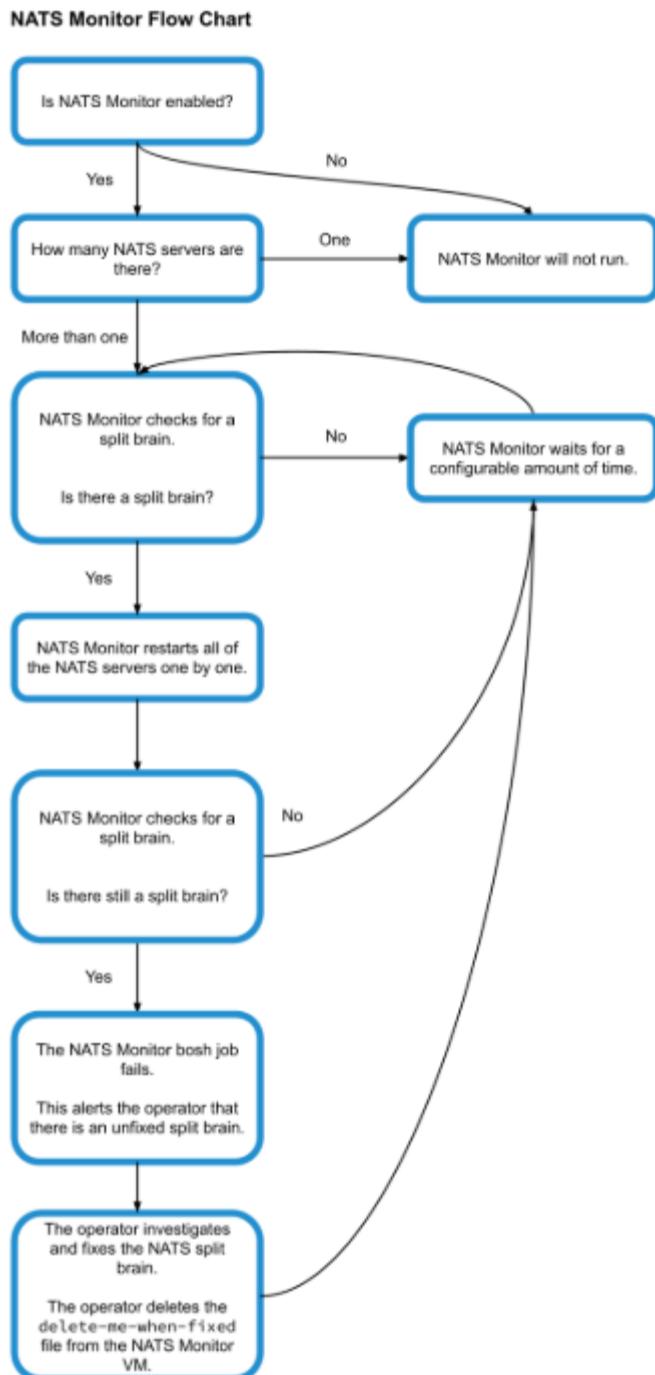
- Detects split brains caused by bugs
- Logs helpful information about the time and nature of the split brain for better root cause analysis
- Optionally restarts the NATS servers to fix the split brain
  - If restarting the NATS servers does not fix the split brain, then the NATS monitor will start failing to alert the operator of the continued split brain issue.
- Won't restart more than one NATS server at a time. It always makes sure the previously restarted NATS server comes up successfully before restarting the next one.
- Does not run if there is only one NATS server. No split brain is possible if there is only one NATS server. This reduces overhead for small development environments.

### NATS Monitor does not:

- Detect split brains caused by ongoing network issues. If the NATS monitor cannot connect to all NATS servers, then it does not start its detection cycle. If the split brain is caused by an ongoing network issue, then it is outside of the scope of the TAS for VMs platform.

## NATS Monitor Flow Chart

The NATS Monitor works as shown in the following flowchart.



## Configure NATS Monitor

Operators can configure the NATS Monitor using the following properties in the **Networking** tab of the TAS for VMs tile, v6.0.17 and higher.

Property	Description
Run NATS Monitor / Do not run NATS Monitor	If “run” is selected, and there is more than one NATS server, the NATS Monitor runs and monitors for NATS split brains. Default: <b>Do not run NATS Monitor.</b>
Restart NATS when split brains are detected	If selected, when NATS Monitor detects a split brain, then NATS Monitor restarts the NATS servers to fix the issue. This is the default.  If unselected, when NATS Monitor detects a split brain, then it ONLY logs that there is an issue. In this case, NATS Monitor does NOT attempt to fix the issue.
Test frequency in seconds	The frequency that the NATS Monitor checks for split brains in seconds. Default: <code>180</code>
Log level	Log level options for NATS Monitor. Options are: <code>info</code> (default), <code>debug</code> , and <code>error</code> .

## NATS Monitor Example Logs

The following example logs are all from `nats-monitor.stdout.log`.

### When there is no split brain

Ideally, there is never a split brain. These examples show the logs from one cycle of the split brain detection loop.

```
# Starting split brain detection loop
{"timestamp":"2025-05-27T20:48:23.360610274Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.starting-split-brain-detection","data": {"session": "6"}}

# Split brain detection loop is over! No split brain!
{"timestamp":"2025-05-27T20:48:53.424635472Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.no-split-brain-detected","data": {"session": "6"}}
```

### When NATS Monitor detects a split brain

When NATS Monitor detects a split brain, it logs helpful information about which NATS servers can't communicate with each other. These logs can help with further root cause analysis of what caused the NATS split brain.

```
# Split brain detection loop starts
{"timestamp":"2025-05-28T11:52:56.862349860Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.starting-split-brain-detection","data": {"session": "6"}}

# Logging which NATS server instances are missing which messages for further debugging
{"timestamp":"2025-05-28T11:53:11.884996082Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data": {"missing_on_instance": 1,"published_on_instance": 0,"session": "1"}}
{"timestamp":"2025-05-28T11:53:16.885946565Z","level":"info","source":"nats-monitor","message": "NATS split brain detected between session 1 and session 6"}
```

```

onitor","message":"nats-monitor.message-queues-manager.message-missing","data": {"missing_on_instance":2,"published_on_instance":0,"session":"1"}}
{"timestamp":"2025-05-28T11:53:31.907809161Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data": {"missing_on_instance":0,"published_on_instance":1,"session":"1"}}
{"timestamp":"2025-05-28T11:53:46.929663840Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data": {"missing_on_instance":0,"published_on_instance":2,"session":"1"}}

# Warns that a split brain was detected
{"timestamp":"2025-05-28T11:53:46.929788806Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.detected-possible-split-brain","data": {"session":"6"}}

# Restarts NATS Server 0 and reconnects when it is back up
{"timestamp":"2025-05-28T11:53:46.985804613Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.initiating-graceful-restart","data": {"instance":0,"session":"6"}}
{"timestamp":"2025-05-28T11:53:46.985901771Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.waiting-until-nats-is-back-up","data": {"instance":0,"session":"6"}}
{"timestamp":"2025-05-28T11:53:46.988369473Z","level":"info","source":"nats-monitor","message":"nats-monitor.nats-subscriber.disconnected","data": {"instance":0,"session":"2"}}
{"timestamp":"2025-05-28T11:53:46.988523482Z","level":"error","source":"nats-monitor","message":"nats-monitor.split-brain-detector.nats-connector.failed-to-connect-to-nats","data": {"attempt":1,"error":"nats-connection-failure: nats: no servers available for connection","session":"6.1"}}
{"timestamp":"2025-05-28T11:53:47.990696524Z","level":"error","source":"nats-monitor","message":"nats-monitor.split-brain-detector.nats-connector.failed-to-connect-to-nats","data": {"attempt":2,"error":"nats-connection-failure: nats: no servers available for connection","session":"6.1"}}
{"timestamp":"2025-05-28T11:53:49.929787830Z","level":"info","source":"nats-monitor","message":"nats-monitor.nats-subscriber.reconnected","data": {"instance":0,"session":"2"}}

# ...repeat restart and reconnect for NATS Server 1 and 2

# Split brain detection loop restarts to see if restarting the NATS servers fixed the issue
{"timestamp":"2025-05-28T11:54:10.101755121Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.checking-if-split-brain-is-fixed","data": {"session":"6"}}

```

## When the split brain is fixed

When the split brain is fixed by restarting the NATS servers, then NATS Monitor celebrates in the logs.

```

# Split brain detection loop restarts to see if restarting the NATS servers fixed the issue
{"timestamp":"2025-05-28T18:04:16.009787729Z","level":"info","source":"nats-monitor"

```

```
onitor","message":"nats-monitor.split-brain-detector.checking-if-split-brain-is-fixed","data":{"session":"6"}}

# The split brain was fixed! Hooray!
{"timestamp":"2025-05-28T18:04:46.092882315Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.split-brain-is-fixed","data":{"note":"hooray!!","session":"6"}}
```

## When there is a split brain that NATS monitor fails to fix

Based on experience with these types of NATS split brains, they have always been fixed by restarting the NATS servers. However, there is always a chance that the split brain is not fixed. In this case, NATS Monitor starts failing; this alerts the operator that something is wrong.

```
# After the NATS Monitor restarts the NATS Servers it re-runs the split brain detection cycle to see if the restarts fixed the issue.

{"timestamp":"2025-05-28T11:54:10.101755121Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.checking-if-split-brain-is-fixed","data":{"session":"6"}}

# In this case, there is still a split brain.
# Data about the split brain is logged.
{"timestamp":"2025-05-28T11:54:25.128046827Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data":{"missing_on_instance":1,"published_on_instance":0,"session":"1"}}
 {"timestamp":"2025-05-28T11:54:30.130517640Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data":{"missing_on_instance":2,"published_on_instance":0,"session":"1"}}
 \{"timestamp":"2025-05-28T11:54:45.153149718Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data":{"missing_on_instance":0,"published_on_instance":1,"session":"1"}}
 {"timestamp":"2025-05-28T11:55:00.178705089Z","level":"info","source":"nats-monitor","message":"nats-monitor.message-queues-manager.message-missing","data":{"missing_on_instance":0,"published_on_instance":2,"session":"1"}}

# Warns that split brain persists
 {"timestamp":"2025-05-28T11:55:00.178836888Z","level":"info","source":"nats-monitor","message":"nats-monitor.split-brain-detector.split-brain-persists-even-after-restarting-all-nats-servers","data":{"session":"6"}}

# NATS Monitor exists so that bosh will mark the job as failing and this will warn the operator
 {"timestamp":"2025-05-28T11:55:00.179264469Z","level":"info","source":"nats-monitor","message":"nats-monitor.nats-subscriber.exiting","data":{"instance":2,"session":"4"}}
 {"timestamp":"2025-05-28T11:55:00.179463952Z","level":"info","source":"nats-monitor","message":"nats-monitor.nats-subscriber.disconnected","data":{"instance":2,"session":"4"}}
 {"timestamp":"2025-05-28T11:55:00.179534624Z","level":"info","source":"nats-monitor","message":"nats-monitor.nats-subscriber.exiting","data":{"instance":2,"session":"4"}}
```

```

1,"session":"3"}}
{"timestamp":"2025-05-28T11:55:00.179600935Z","level":"info","source":"nats-m
onitor","message":"nats-monitor.nats-subscriber.disconnected","data": {"instan
ce":1,"session":"3"}}
 {"timestamp":"2025-05-28T11:55:00.179714722Z","level":"info","source":"nats-m
onitor","message":"nats-monitor.nats-subscriber.exiting","data": {"instan
ce":0,"session":"2"}}
 {"timestamp":"2025-05-28T11:55:00.179769937Z","level":"info","source":"nats-m
onitor","message":"nats-monitor.nats-subscriber.disconnected","data": {"instan
ce":0,"session":"2"}}
 {"timestamp":"2025-05-28T11:55:00.179971128Z","level":"error","source":"nats-
monitor","message":"nats-monitor.exited-with-failure","data": {"error":"Exit t
race for group:\nsplit-brain-detector exited with error: failed-to-fix-split-
brain-via-restarting-nats-servers\nnats-subscriber-2 exited with nil\nnats-su
bscriber-1 exited with nil\nnats-subscriber-0 exited with nil\n"}}
# When Bosh restarts the job it will continue to fail while the /var/vcap/dat
a/nats-monitor/split-brain-detected/delete-me-when-fixed file exists.
# This keeps the job failing so that operators are warned and can investigate
the split brain issue.
 {"timestamp":"2025-05-28T11:55:08.429850556Z","level":"info","source":"nats-m
onitor","message":"nats-monitor.starting","data": {}}
 {"timestamp":"2025-05-28T11:55:08.430114376Z","level":"error","source":"nats-
monitor","message":"nats-monitor.unfixed-split-brain-detected-failing-to-aler
t-the-operator","data": {"error":"cannot start up when a previously unfixed sp
lit brain is detected","file":"/var/vcap/data/nats-monitor/split-brain-detect
ed/delete-me-when-fixed","note":"delete the file when the split brain is fixe
d, then the nats-monitor will start running successfully again"}}

```

## How to detect and fix a NATS split brain without NATS monitor

NATS Monitor is only available starting in TAS for VMs 6.0.17. If you are on an earlier version of TAS for VMs then follow the mitigation steps laid out in this [Knowledge Base article](#).

# Additional Resources

In this section:

- [Automation scripts for upgrading Small Footprint TAS](#)
- [Failure to create containers when upgrading with shared Microsoft base image](#)
- [Autoscaler Error “Unable to scale due to Cloud Controller error”](#)

## Automation scripts for upgrading Small Footprint TAS

If you have installed Small Footprint VMware Tanzu Application Service for VMs 6.0, you can upgrade your installation to full TAS for VMs 6.0. The upgrade process preserves most of the existing tile configuration and transforms the existing Small Footprint TAS for VMs into full TAS for VMs.

See [Upgrading from Small Footprint to full TAS for VMs](#) for detailed instructions on how to use these Bash scripts in your upgrade. Pay special attention to the sections that describe the [upgrade process](#) and [safety considerations](#) to ensure that your upgrade goes as smoothly as possible.

Small footprint migration automation scripts (for use with the [Assisted upgrade](#) section):

- The `validate_sf_tas_deployment` script runs against a Small Footprint TAS for VMs deployment and does not alter the deployment in any way. The script scans the deployment configuration to determine if all requirements for the upgrade process are met, and prints out any missing requirements for you to correct. When the script executes successfully, the deployment is ready to be upgraded to full TAS for VMs.
- The `reattach_sf_tas_disks` script runs against a full TAS for VMs deployment after the deployment has been upgraded from Small Footprint TAS for VMs. The script scans the deployment to ensure that the database and blobstore have at most one instance, and if so, automatically stops all VMs, reattaches the Small Footprint TAS disks, and restarts the deployment. You can run the script multiple times if necessary. It creates log files to determine which instances already have disks reattached, and skips those instances in future executions. When the script executes successfully, the upgrade from Small Footprint TAS for VMs to full TAS for VMs is complete.

These scripts can be found in the `6.0_sf_tas_to_full_tas_upgrade_scripts` bundle.

## Failure to create containers when upgrading with shared Microsoft base image

When upgrading between versions of the Windows `rootfs` (`windows1803fs` or `windows2019fs`) in VMware Tanzu Application Service for VMs (TAS for VMs) that have a shared Microsoft base layer, there may be failures to create containers, causing the upgrade to fail.

When upgrading between versions of the Windows `rootfs` (windows1803fs or windows2019fs) in TAS for VMs [Windows] that have a shared Microsoft base layer, there may be failures to create containers, causing the deployment to fail. If there are stemcell changes or if the Microsoft base layer changes, this error likely does not occur. When the stemcell changes, the Windows Diego Cells are recreated during the upgrade so any corruption of the Microsoft base layer is irrelevant. When the Microsoft base layer changes, if there is corruption to the old base layer, it will not impact the upgrade because the new layer will replace the old one instead of being shared.

This error has been seen with Windows Server 1803 and Windows Server 2019, and on GCP, Azure, vSphere, and AWS.

To investigate this issue, you will need to be able to SSH to the Tanzu Operations Manager VM and run commands with the BOSH CLI.

## Error Type #1: The pre-start script for the Windowsfs job fails which causes the TAS for VMs [Windows] upgrade to fail

This one occurs when there is a custom CA certificate injection that occurs when the `rootfs` job starts up because we try to create a container in order to add the new layer with the certificates in it.

### Operations Manager output

```
Task 308031 | 13:47:04 | Preparing deployment: Preparing deployment (00:00:03)

Task 308031 | 13:47:11 | Preparing package compilation: Finding packages to compile (0:00:00)

Task 308031 | 13:47:21 | Updating instance windows_diego_cell: windows_diego_cell/44c5841f-7580-4e9c-9856-89fcbe08ab0d (2) (canary) (00:00:35)

L Error: Action Failed get_task: Task 59ba76d1-14c5-4d7b-681c-08b9ec4bd64d result: 1 of 10 pre-start scripts failed. Failed Jobs: windows1803fs. Successful Jobs: set_kms_host, groot, loggregator_agent_windows, bosh-dns-windows, rep_windows, winc-network-1803, set_password, enable_ssh, enable_rdp.

Task 308031 | 13:47:56 | Error: Action Failed get_task: Task 59ba76d1-14c5-4d7b-681c-08b9ec4bd64d result: 1 of 10 pre-start scripts failed. Failed Jobs: windows1803fs. Successful Jobs: set_kms_host, groot, loggregator_agent_windows, bosh-dns-windows, rep_windows, winc-network-1803, set_password, enable_ssh, enable_rdp.
```

## BOSH Job logs

1. Run `bosh deployments` and look for the `<pas-windows-GUID>` deployment name.
2. Run `export BOSH_DEPLOYMENT=<pas-windows-GUID>`
3. Run `bosh vms` and look for the name of the failing Windows Diego cell.
4. Run `bosh logs windows_diego_cell/<GUID>` with the GUID of the failing Windows Diego cell.
5. In the `windows1803fs` or `windows2019fs` `pre-start.stderr.log`, search for an error that looks similar to this:

```
container layer-1557177919 encountered an error during Start: failure in a Windows system call: The compute system exited unexpectedly. (0xc0370106)
```

## Error Type #2: The post-start script for the rep\_windows job fails which causes the TAS for VMs [Windows] upgrade to fail

This error occurs if there is a problem with the base image and there are no custom certificates to inject. If there are no custom certificates to inject, the `rootfs` job (i.e. `windows1803fs`) will not try to create a container and will successfully start up. After all of the jobs have started, the `post-start` scripts get run. In the `rep_windows` job, the `post-start` script tries to create a container first and it will be the one to fail.

### Operations Manager Output

```
Task 8192 | 21:12:30 | Updating instance windows2019-cell: windows2019-cell/bd6d70b9-ed1f-412f-9d49-8045627f4ab3 (0) (canary) (00:17:24)
          L Error: Action Failed get_task: Task a9555020-1a3b-40c7-677c-d6fc392ce135 result: 1 of 3 post-start scripts failed. Failed Jobs: rep_windows. Successful Jobs: route_emitter_windows, bosh-dns-windows.
Task 8192 | 21:29:55 | Error: Action Failed get_task: Task a9555020-1a3b-40c7-677c-d6fc392ce135 result: 1 of 3 post-start scripts failed. Failed Jobs: rep_windows. Successful Jobs: route_emitter_windows, bosh-dns-windows.
```

## BOSH Job logs

1. Run `bosh deployments` and look for the `<pas-windows-GUID>` deployment name.
2. Run `export BOSH_DEPLOYMENT=<pas-windows-GUID>`
3. Run `bosh vms` and look for the name of the failing Windows Diego cell.
4. Run `bosh logs windows_diego_cell/GUID` with the GUID of the failing Windows Diego cell.
5. In the `rep_windows` directory, in the `rep_windows` subdirectory, search the `job-service-wrapper.out.log` for an error that looks similar to this:

```
{"timestamp": "2019-07-29T14:59:56.406860500Z", "level": "error", "source": "rep", "message": "rep.exited-with-failure", "data": {"error": "Exit trace for group:\nngardenn_health_checker exited with error: runc run: exit status 1: container check-c403ce0e-7875-4c04-517a-b1a790e2d323 encountered an error during Start: failure in a Windows system call: The virtual machine or container exited unexpectedly. (0xc0370106)\ncontainer-metrics-reporter exited with nil\nhub-closer exited with nil\nmetrics-reporter exited with nil\nvolman-driver-syncer exited with nil\ndebug-server exited with nil\\n"}}
```

## Workaround #1: Recreate all of the Windows Diego cells, then restart the upgrade

(Time: High; Difficulty Level: Low)

This workaround recreates the Windows Diego cells on upgrade in order for the Microsoft base image to be usable.

Steps:

1. Go to the BOSH Director tile.
2. In the **Settings** tab, go to **Director Config**, enable **Recreate All VMs**, and click **Save**.
3. Return to the dashboard, and go to **Review Pending Changes**.
4. (Optional) Unselect **Pending changes for Tanzu Application Service**. This will allow re-creation of only TAS for VMs [Windows] deployments, which will make the upgrade faster.
5. Click **Apply Changes**.

## Workaround #2: Delete the size file in the shared base image on each Windows Diego cell then restart the upgrade in the Operations Manager UI

(Time: Medium; Difficulty Level: High)

This workaround requires Enable BOSH-native SSH support on all VMs (beta) to be enabled in the **TAS for VMs [Windows] > VM Options** configuration. By deleting the Size file, our BOSH jobs will replace this layer even if it is shared between the old `rootfs` and the `rootfs` we are upgrading to and that will fix the issue. It will increase the upgrade time by a couple of minutes because each VM will need to re-extract the Microsoft base layer, which is rather large. After you have deleted the Size file in the base layer directory on each VM, you can proceed with the upgrade in the Operations Manager UI.

Steps:

1. Run `bosh deployments` and look for the name of the `pas-windows-GUID` deployment.
2. Run `export BOSH_DEPLOYMENT=<pas-windows-GUID>`.
3. Run `bosh vms`.
4. Do the following for every windows Diego cell:
  1. Run `bosh ssh windows_diego_cell/GUID`
  2. Run `powershell`
  3. Run `stop-service rep_windows`
  4. Run `cd C:\var\vcap\data\groot\layers`
  5. Run:

```
$largest=[long]"0"; $largestSha=""; Get-ChildItem | ForEach-Object { If([long](Get-Content $_\size) -Gt $largest){ $largest=[long](Get-Content $_\size); $largestSha=$_.Name } }; cd $largestSha; rm size
```

This will remove the `size` file from the base layer directory.

6. Exit powershell.
7. Exit the cell.
5. Continue the upgrade in the Operations Manager UI.

## Workaround #3: Power-cycle the VM then restart the upgrade in the Operations Manager

(Time: High; Difficulty Level: High)

This workaround is dependent on your IaaS. It involves turning on RDP for each cell and creating an Administrator user whose password is known, calling `bosh stop` on each cell, logging in to your IaaS console, turning off each VM (each Windows Diego Cell), and then turning them back on.

After each VM has restarted, you will need to RDP onto the cell and manually start the `bosh-agent` service by running `Start-Service bosh-agent` in Powershell. SSH cannot be used in this step because the BOSH agent is stopped and the job that allows SSH is stopped, therefore, RDP is necessary.

With this workaround, you do not require access to the Operations Manager VM or BOSH director. This workaround appears to work because it powers off all the Windows services, then turns them back on, and the shared Microsoft base layer is usable again.

This workaround is different from `bosh restart`, which stops and starts only our BOSH jobs. After you have power-cycled each VM and turned the `bosh-agent` service back on, you can proceed with the upgrade in the Operations Manager UI.

## Autoscaler Error “Unable to scale due to Cloud Controller error”

In Apps Manager, in the Manage window for your Autoscaler instance, you see the following error in the Autoscaler events:

```
Unable to scale due to Cloud Controller error.
```

This error can be caused for a number of reasons. Ultimately, this issue is caused when the autoscaler can not complete the autoscale request.

There are multiple potential problems that could be causing this error, the first step is to determine the actual problem.

1. To start, get the app's GUID by running:

```
cf app <app-name> --guid
```

2. Then search for the `guid` in the autoscaler's logs by running:

```
cf logs autoscale --recent | grep <app guid>
```

3. Now look for any errors, failures, or incomplete requests containing that `guid`. Refer to the examples below for the kind of errors you might see.

## Example 1

- Autoscaler's Manage console in Apps Manager shows `Unable to scale due to Cloud Controller error`.
- We targeted the Autoscale app with `cf target -o system -s autoscaling`.

- We ran `cf logs autoscale --recent | grep <app guid>` and found the following error:

```
2017-10-18T08:57:32.86-0700 [APP/PROC/WEB/0] OUT time="2017-10-18T15:57:32Z"
level=error msg="Failed to scale application" app_guid=<guid>
body="{\n  \"code\": 310003,\n  \"description\": \"You have exceeded your space's memory limit.\n\", \n  \"error_code\": \"CF-SpaceQuotaMemoryLimitExceeded\"\n}" code=400 requested_instances=4
```

- In this case, the bound app was in a space that had a Memory Quota of 10GB. When the Autoscaler attempted to scale up the bound app, we hit the quota limit. There were already 10 app instances running in the space with 1GB of Memory allocated for each.
- To get past a situation such as this, you can increase the space's Memory Quota, or you can run `cf stop <app-name>` on apps running in the space that don't need to be running in order to free some memory.

## Example 2

- Autoscaler's Manage console in Apps Manager shows `Unable to scale due to Cloud Controller error`.
- We targeted the Autoscale app with `cf target -o system -s autoscaling`
- We ran `cf logs autoscale --recent | grep <app guid>` and found the following error:

```
2017-09-21T12:14:08.99-0400 [APP/PROC/WEB/0] OUT time="2017-09-21T16:14:08Z"
level=warning msg="Failed to get application stats"
app_guid=8473ec5f-2c3b-43de-bfd7-b78ca26eb983 body="{\n  \"description\": \"Could not fetch stats for stopped app: GetLinkedAccounts\", \n  \"error_code\": \"CF-AppStoppedStatsError\", \n  \"code\": 200003\n}" code=400
```

- In this case, the bound app was in a non-running state. If the bound app is not running, crashed, or stopped, the Autoscaler can not complete the `/stats` call for it to determine if the app needs scaled up or down.
- To get past a situation such as this, verify that your app is not crashing occasionally by running `cf events <app-name>`. If your app has crashed, you will see entries similar to the following in your cf events output:

```
2017-09-14T01:56:56.00-0400 app.crash <app-name> index: 3, reason: CRASHED, exit_description: 2 error(s) occurred:
```

## Related Products

See the following links for product documentation related to VMware Tanzu Application Service for VMs (TAS for VMs):

- [VMware Tanzu Operations Manager \(Tanzu Operations Manager\) documentation](#)
- [VMware Tanzu Kubernetes Grid Integrated Edition \(TKGI\) documentation](#)
- [Tanzu Kubernetes Grid \(TKG\) documentation](#)