



# Pivotal Cloud Foundry 2.1: Making Transformation Real

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# Agenda

- Pivotal Value Proposition
- PCF 2.1 Update
- PCF Services
- Q&A



# The Pivotal value proposition



## Developer Productivity

- Accelerate feedback loops by improving delivery velocity
- Focus on applications, not infrastructure
- Give developers the tools and frameworks to build resilient apps



## Operational Efficiency

- Employ 500:1 developer to operator ratio
- Perform zero-downtime upgrades
- Runs the same way on every public/private cloud



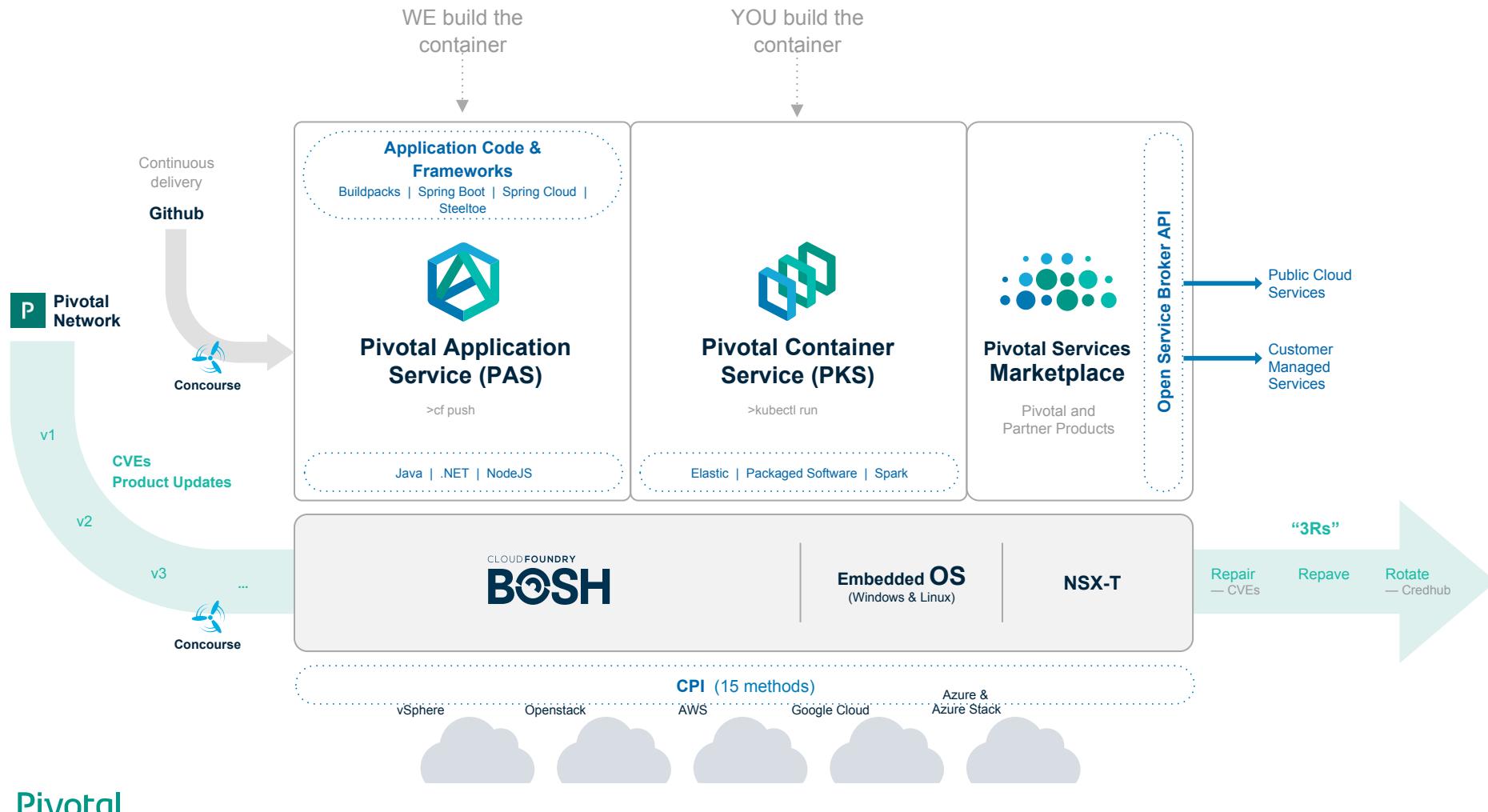
## Comprehensive Security

- Adopt a defense-in-depth approach
- Continuously update platforms to limit threat impact
- Apply the 3 R's → repair, repave, rotate



## High Availability

- Run platforms that stay online under all circumstances
- Scale up and down, in and out, through automation
- Deploy multi-cloud resilience patterns



# What Customer Outcomes Look Like



Adib Saikali  
@asaikali

Follow

@scotiabank scaled to 29 teams in 4 countries 3000+ deploys/month in 10 month with @pivotalcf transforming a 185 year old bank #SpringOne



10:28 AM - 5 Dec 2017



Nate Schutta  
@ntschutta

Follow

I'll say it again - yes \*your\* company in \*your\* industry can adapt and change. You too can go from releases in 14 months to 14 days like @markardito at @HCSC #springone



9:22 AM - 7 Dec 2017



Zach Brown  
@moredeploy

This is how you \_do\_ software:  
"The tanker refuelling system software for the air force – which runs on Pivotal #CloudFoundry – was built [by @pivotallabs] for <\$2 million in 90 days and is currently saving the US Air Force \$1 million/day in fuel costs..."



# Operations Manager

## 2.1

Operator Efficiency

- Stemcell Library (demo)
- Operators can apply custom VM extensions to instance groups
- Improved IP handling / usage
- Operators can selectively deploy tiles (BETA)

# Demo

## Stemcell Manager

The screenshot shows a tablet displaying a web-based application for managing stemcells. The interface has a header with a back button labeled "INSTALLATION DASHBOARD" and a title "Manage Stemcells". Below the title is a table with four columns: "Product", "Required", "Deployed", and "Staged".

Product	Required	Deployed	Staged
Ops Manager: Example Product	ubuntu-trusty 3541.4	-	<input type="text" value="3541.4"/> Latest stemcell.
Ops Manager: Example Product prod2	ubuntu-trusty 3468.21	-	<b>IMPORT STEMCELL</b> No compatible stemcell available.
Ops Manager: Example Product prod1	ubuntu-trusty 3468.19	-	<b>IMPORT STEMCELL</b> No compatible stemcell available.

At the top right of the screen are two buttons: "IMPORT STEMCELL" and "SAVE". The bottom of the screen features a dark bar with the Apple logo.

# Operations Manager

## 2.1

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Operator Efficiency

- CredHub is deployable on a Luna HSM
- Expanded concurrency for RBAC
- User-provided encryption key for AWS volumes
- SSH / UI login banners
- Encrypted copy of OM AMI on AWS via KMS

# Ops Manager 2.1 BOSH Backup & Restore (BBR)

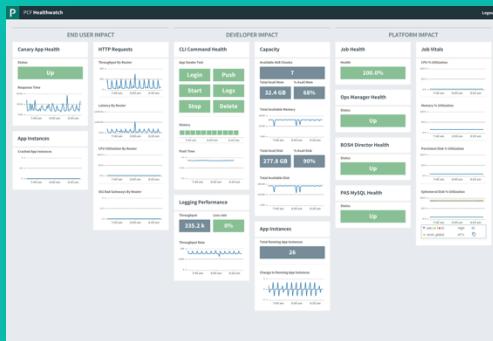
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Operator Efficiency

- AZs on vSphere can consist of multiple clusters
- GCS blobstore configuration for Director VM
- AWS ALB support
- BBR External S3 blobstore support
- BBR CloudSQL or other external mySQL support
- BBR Performance enhancements to minimize CF API downtime

# PCF Healthwatch 1.2

Operator Efficiency



- **Alerting.** KPI/KSI out of the box Alerts with configuration of shipped thresholds
- **Isolation Segments.** Handling impacts to Healthwatch super-metrics produced; Impacts to Healthwatch UI
- **Data.** Data Store & Data Aggregation Improvements

Adapts for PCF 2.1 relevant KPI/KSI changes

PCF 2.1

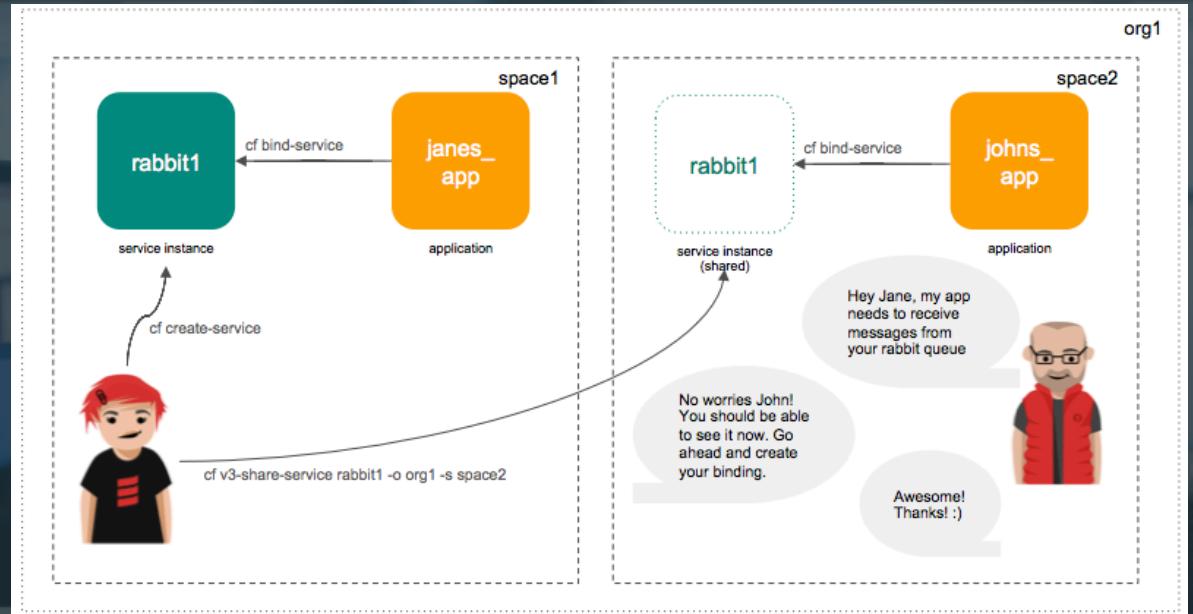
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# Pivotal Application Service



# Service Instance Sharing (BETA)

Developer Productivity



- Beta in PCF 2.1 | Opt-in only\*

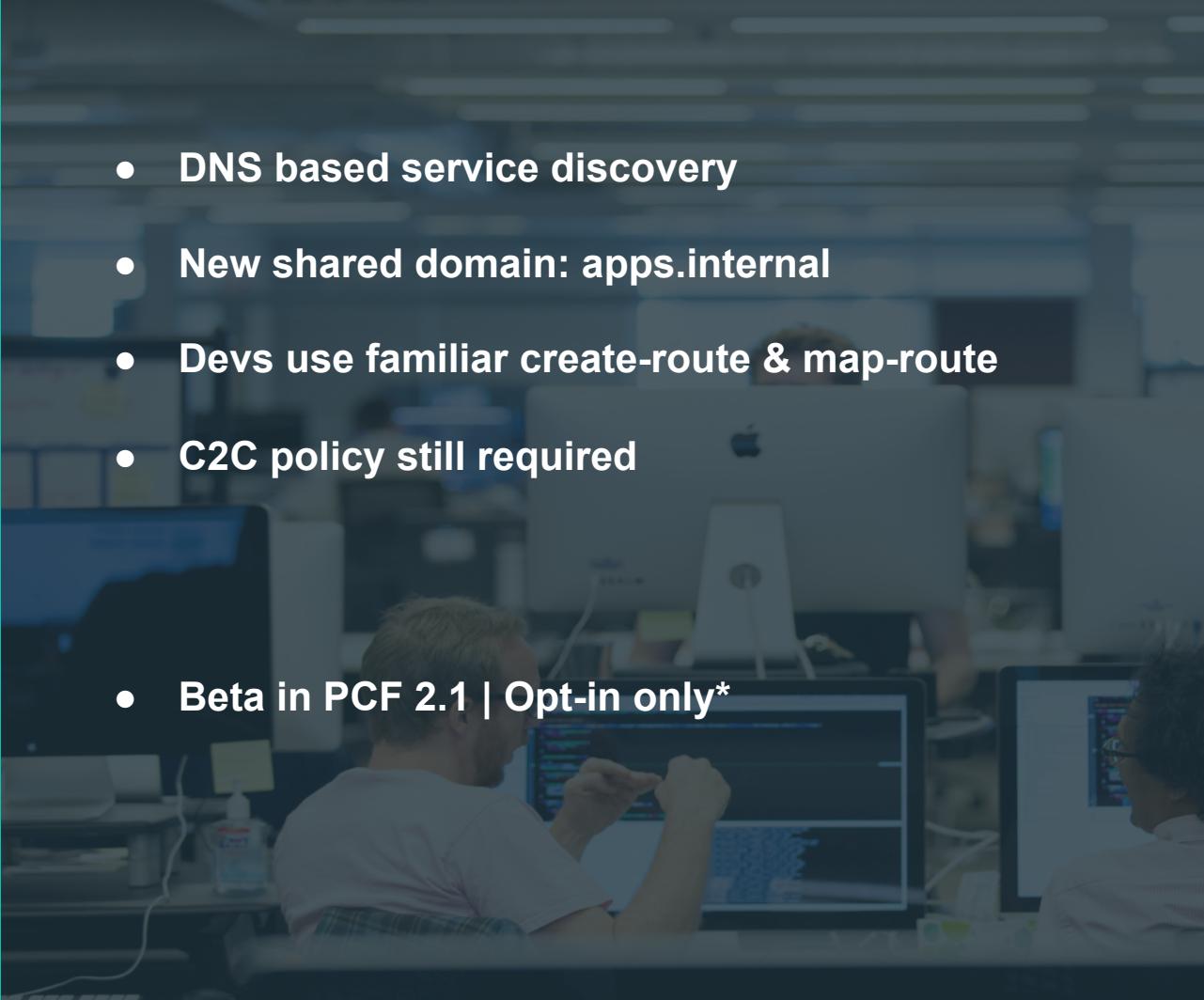
# C2C Polyglot Service Discovery (BETA)

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Developer Productivity

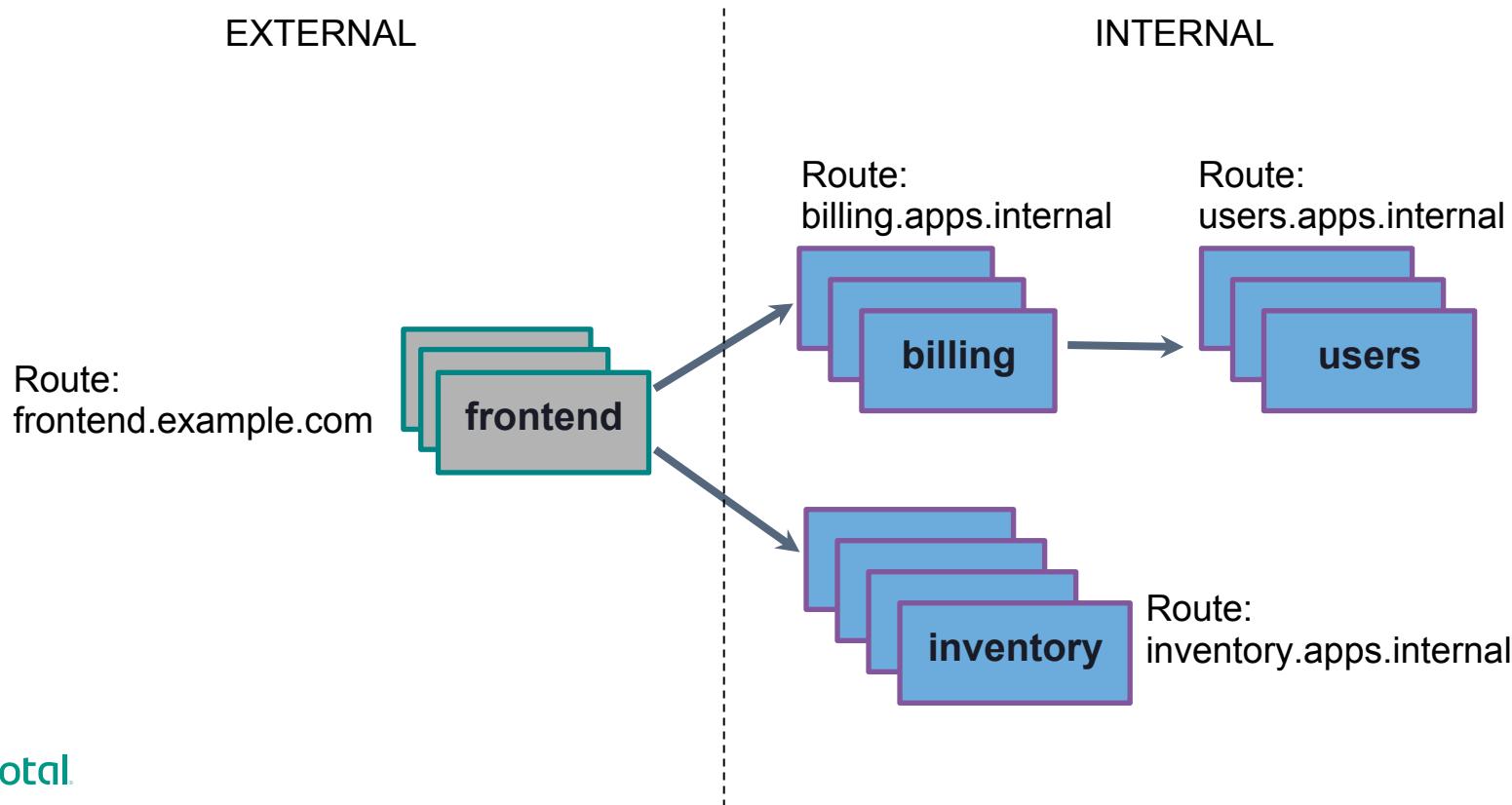
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- DNS based service discovery
- New shared domain: apps.internal
- Devs use familiar create-route & map-route
- C2C policy still required
- Beta in PCF 2.1 | Opt-in only\*



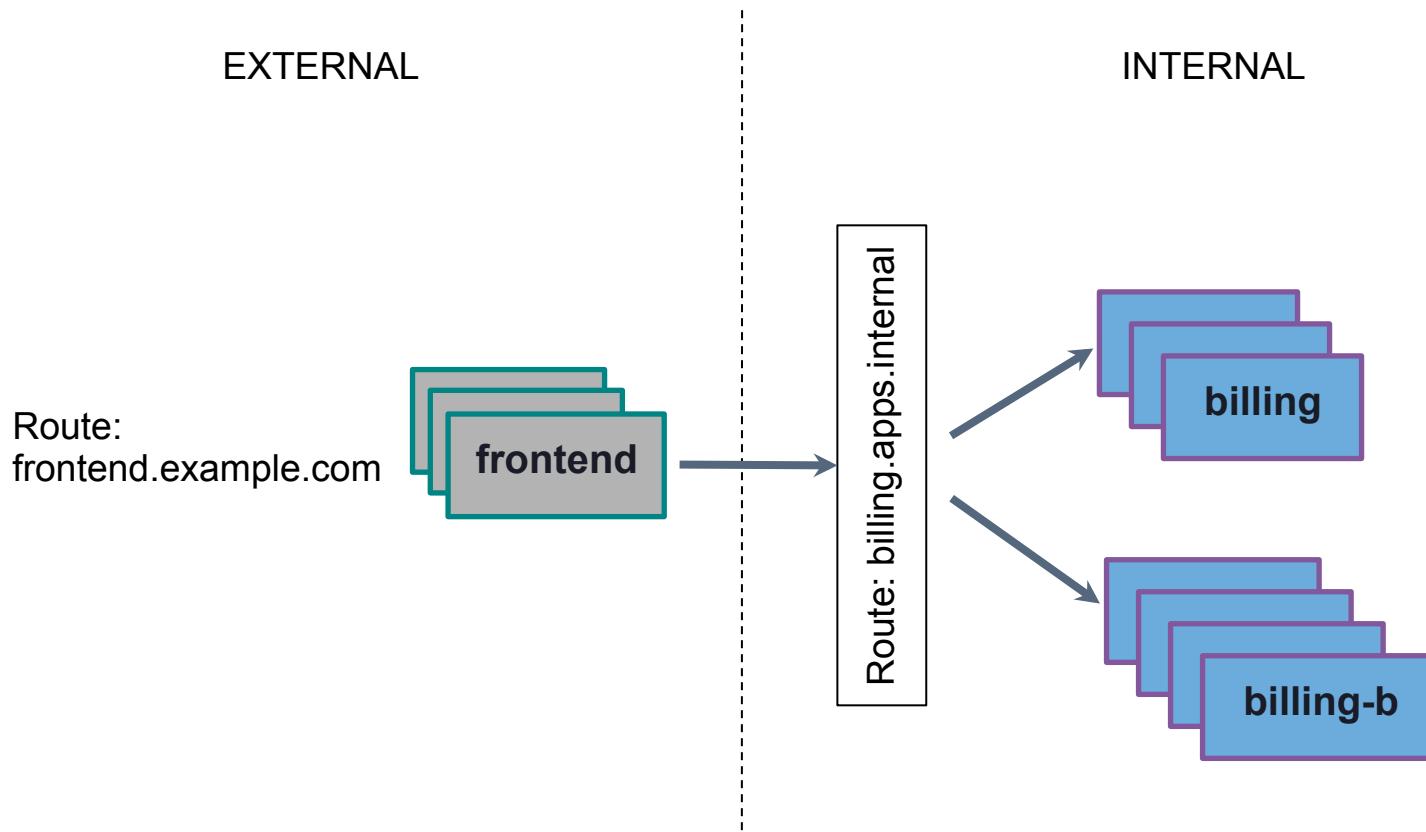
# Use Case 1: Secure Microservices

Create internal routes to make internal services only accessible within PCF



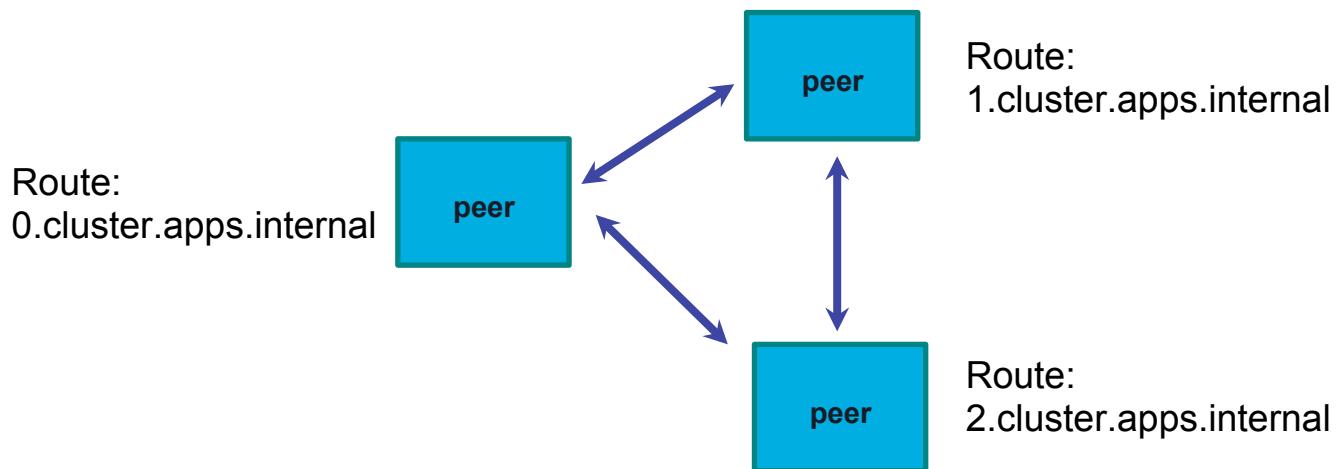
# Use Case 2: Blue-Green Deploys

Map multiple apps to the same internal route



# Use Case 3: Clustering Applications

Access individual instances of an application using instance-based DNS



# Applications Manager

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## Developer Productivity

- Supports view of processes, scaling instances, modifying memory/disk
- Supports ability to use JSON for arbitrary parameters and environment variables

The screenshot displays the Pivotal Applications Manager interface for a multi-process application named "multi-process-app".

**Overview:** Shows the application is running with 4/5 instances allocated. Memory Allocated: 0.03 / 2.50 GB, Disk Allocated: 0.10 / 5.00 GB.

**Events:** Lists recent events including scaled instances and a crashed app.

**Logs:** Shows log entries for various processes like web, scheduler, and worker.

**Tasks:** Lists tasks such as scaling, stopping, and starting instances.

**Settings:** Allows configuration of buildpacks and other settings.

**Scaling Options:** A separate panel titled "Scale app" shows the current configuration for each process type (web, scheduler, worker) with instances set to 2, memory limit at 512 MB, and disk limit at 1 GB. An "APPLY CHANGES" button is present.

# App Autoscaler

Developer Productivity

Pivotal

## Two New Autoscaling Rule Types

- Container Memory
- RabbitMQ Message Queue Depth
- CF CLI plugin!

The screenshot shows the Cloud Foundry UI interface. On the right, a card for the application 'matt-app-2' is displayed, which is currently enabled. The card includes sections for 'Edit Scaling Rules', 'INSTANCE LIMITS' (Minimum: 1, Maximum: 6), 'SCALING RULES' (Metric: RabbitMQ Depth, Low: 15, High: 25, Status: Active), and 'SCHEDULED LIMITS' (No Scheduled Limit Changes). Below the card is an 'EVENT HISTORY' section with a single entry from Feb 15, 2018 at 9:30 AM. On the left, a terminal window titled '1. bash' is open, showing the output of the command 'cf plugins'. The output lists various autoscaling-related commands and their descriptions.

```
± imaster U:1 ✘ cf plugins
Listing installed plugins...
+-----+-----+-----+-----+
| plugin | version | command name | command help |
+-----+-----+-----+-----+
| App Autoscaler | 1.0.19 | autoscaling-events | Displays apps bound to the autoscaler |
| App Autoscaler | 1.0.19 | autoscaling-events | Displays previous autoscaling events for the app |
| App Autoscaler | 1.0.19 | autoscaling-rules | Displays rules for an autoscaled app |
| App Autoscaler | 1.0.19 | configure-autoscaling | Configures autoscaling using a manifest file |
| App Autoscaler | 1.0.19 | create-autoscaling | Create rule for an autoscaled app |
| App Autoscaler | 1.0.19 | delete-autoscaling-rule | Delete rule for an autoscaled app |
| App Autoscaler | 1.0.19 | delete-autoscaling-rules | Delete all rules for an autoscaled app |
| App Autoscaler | 1.0.19 | disable-autoscaling | Disables autoscaling for the app |
| App Autoscaler | 1.0.19 | enable-autoscaling | Enables autoscaling for the app |
| App Autoscaler | 1.0.19 | update-autoscaling-limits | Updates autoscaling instance limits for the app |
+-----+-----+-----+-----+
Use 'cf repo-plugins' to list plugins in registered repos available to install.
12.3.11 tracker-display in ~/workspace/spring-helloworld-clone
± imaster U:1 ✘ + [
```

# Loggregator

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Operator Efficiency

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- 99% message delivery reliability target achieved!
- Noisy Neighbor Nozzle to help with %1 cases
- CLI + API integrations available
- Metric Drains for App Developers

# Routing and Resilience Improvements

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Secure by Default

- TLS between Gorouter and App containers
- HA Router control plane increases routing resiliency
- Increased guarantees against misrouting
- HAProxy now supports HTTP Strict Transport Security (HSTS)
- Smart ALB cipher suite defaults for Router and HAProxy
- Operator can optionally enable support for PROXY protocol in Gorouter

# PAS for Windows

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First - Class  
Windows and  
.NET Support



- Much anticipated GA RELEASE!
- PASW is a new OpsManager tile using Windows Server Containers. Powered by Windows Server 2016 version 1709 Server Core
- Supported PCF platform features for an on-par experience with Linux applications now include:
  - CPU + network limits, full autoscaling, Diego SSH (i.e. cf ssh), context path routing, multi-buildpacks.
- Can be installed alongside PASW 2012R2 for a smooth upgrade.
- Has same Windows management features (SSH, RDP, KMS, Windows Event Logs) as PASW 2012R2.

# PAS for Windows

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First - Class  
Windows and  
.NET Support



- **New .NET, IIS, and Windows feature support includes:**
- **ASP.NET context path routing**
- **IIS URL Rewrite module**
- **Visual Studio remote debugging (beta! using cf ssh port forwarding)**
- **Windows registry (experimental, per container)**
- **Global Assembly Cache (experimental, per container)**
- **Dedicated file system (experimental, per container)**

# 2016 Container Anatomy



.NET modules (URL  
Rewrite module), etc.

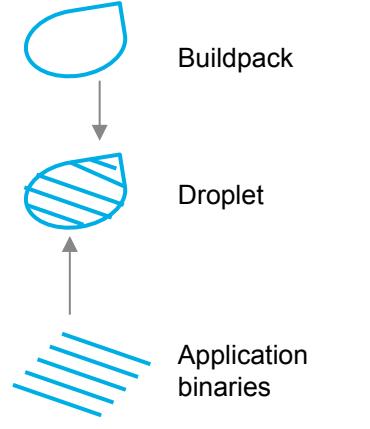
Windows Features  
(.NET, HWC, etc.)

**Windows Server  
Core container base  
image**

Windows Server  
Container

Resulting container  
image at runtime.

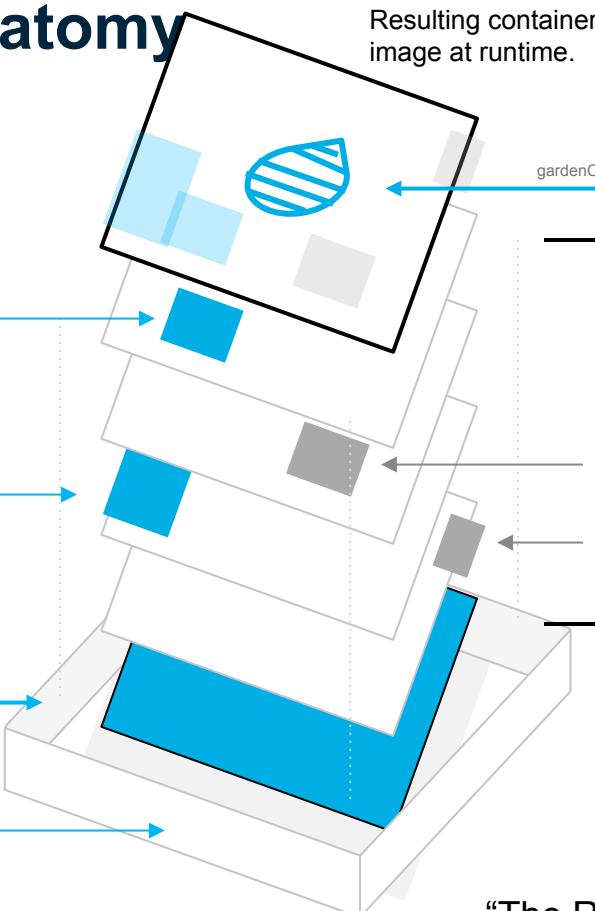
gardenClient.StreamIn



Utilities (git, tar)

User config

App Staging



"The RootFS"

Multiple layers as packaged in windows2016fs-release.

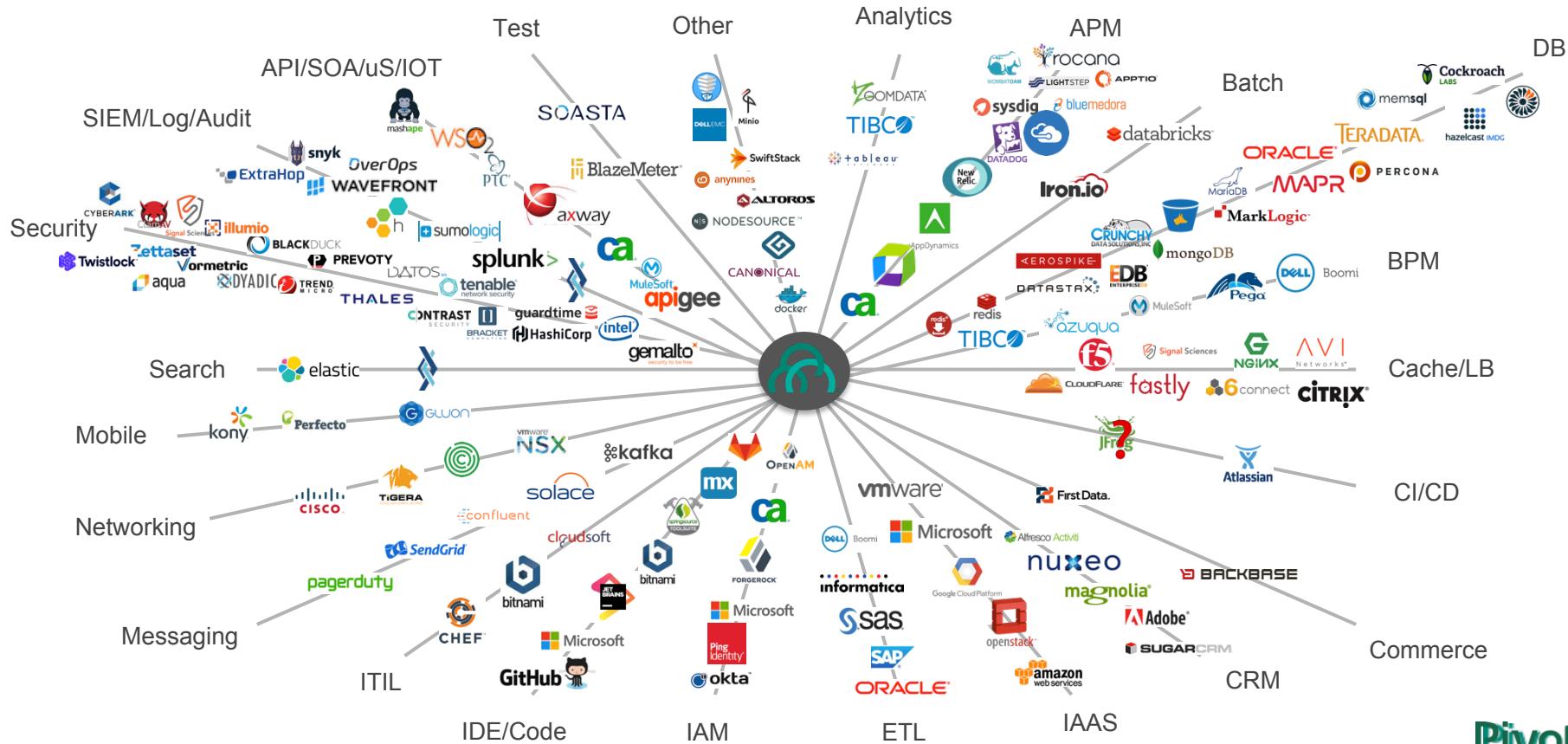
**PCF 2.1**

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# Services



# Pivotal Services Marketplace



# Enterprise Ready Services



## MySQL for PCF

- Enterprise-ready MySQL for your developers
- Automate database operations in developer workflows
- Leader-follower for multi-site HA



## Pivotal Cloud Cache

- High performance, in-memory, data at scale for microservices
- Look-aside caches & HTTP session state caching
- WAN replication



## RabbitMQ for PCF

- Easily connect distributed applications with the most widely deployed open source message broker
- Enable connected scalable, distributed applications
- On-demand clusters



## Redis for PCF

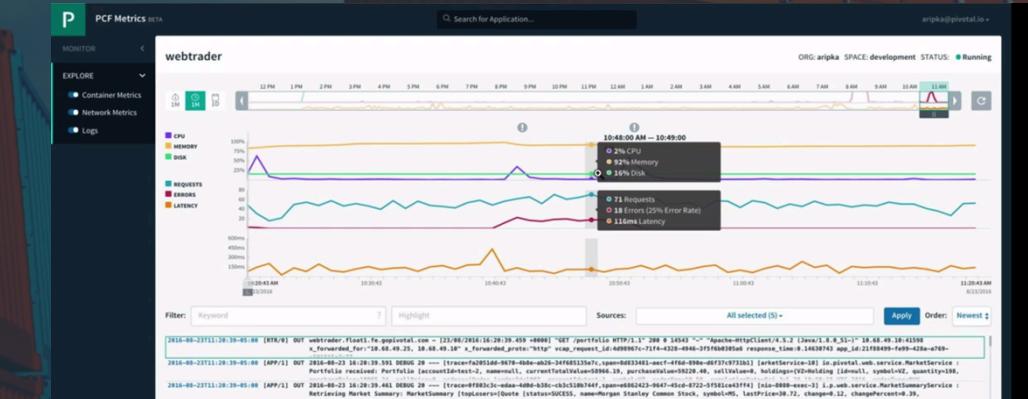
- In-Memory cache and datastore, configured for the enterprise
- Efficient provisioning matched to use cases

BOSH Managed | On-Demand Provisioning | Dedicated Instances | Custom Service Plans

# PCF Metrics 1.5

## Enterprise - Ready Services

- Alerting on app metrics beta
  - Reduce logs storage VM footprint by switching to Postgres
  - Optimize metrics and logs ingestion performance



# Single Sign On (SSO) 1.6

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Enterprise - Ready Services

- **Operator Plan Configuration via API**
- **Multi-Factor Authentication - Preview via API**
- **Plan Visibility for All Orgs**
- **Backup and Restore**
- **Performance Benchmarks**

# mySQL 2.3 for PCF

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Enterprise - Ready Services

- SI network traffic is encrypted via TLS
- Binding credentials stored in Credhub
- Faster upgrades for MySQL tile fleets
- Developers can specify a custom charset & collation when creating/updating a service instance
- Developers now have permissions in their service instances, such as the ability to create multiple schemas

# Redis for PCF

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Enterprise - Ready Services

- **Service Instance Sharing**
- **Create reference architectures for applications with high uptime needs**
- **Increase limit of on-demand instances from 50 to 200**

# RabbitMQ for PCF 1.12

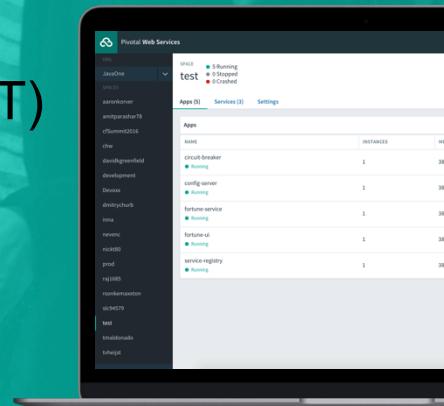
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Enterprise - Ready Services

- **Service Instance Sharing (on demand and multi-tenant)**
- **Secure Service Instance Credentials (on demand only)**
- **RabbitMQ 3.7.x (on-demand only)**
- **Co-located errands to speed up deployments**

# Pivotal®

- Software coming soon to [network.pivotal.io](https://network.pivotal.io)
- Many features available now [run.pivotal.io](https://run.pivotal.io)
- Contact your account team for PKS/PFS availability
- Sign up for the next roadmap call [roadmap-registration.cfapps.io](https://roadmap-registration.cfapps.io)
  - (First Thursday of every month, 2pm ET/11am PT)
- SpringOne Platform 2018 CFP open! <https://springoneplatform.io/cfp>





# Pivotal®

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## Transforming How The World Builds Software