DevOps Release Notes

/ ForgeRock Identity Platform 6.5

Latest update: 6.5.2

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Abstract

Information for deploying ForgeRock Identity Platform™ version 6.5 in DevOps environments. Includes late-breaking news about features, known issues, and using the `forgeops` repository.

Table of Contents

Preface

Read these release notes before you deploy ForgeRock software in DevOps environments or update your existing deployment.

These release notes cover the prerequisites for deployment, known issues and improvements, changes and deprecated functionality, and other important information.

Before You Begin

Before deploying the ForgeRock Identity Platform in a DevOps environment, read the important information in Start Here.

About ForgeRock Identity Platform Software

ForgeRock Identity Platform™ serves as the basis for our simple and comprehensive Identity and Access Management solution. We help our customers deepen their relationships with their customers, and improve the productivity and connectivity of their employees and partners. For more information about ForgeRock and about the platform, see https://www.forgerock.com.

The platform includes the following components:

- ForgeRock® Access Management (AM)
- ForgeRock® Identity Management (IDM)
- ForgeRock® Directory Services (DS)
- ForgeRock® Identity Gateway (IG)

Chapter 1
What's New

This chapter covers new features and improvements in the version 6.5 of the ForgeRock DevOps Examples and Cloud Deployment Model.

1.1. Maintenance Releases

ForgeRock periodically issues maintenance releases of AM, DS, IDM, and IG. These releases provide important fixes to bugs and minor improvements that should require no configuration changes.

New Docker images for the ForgeRock Identity Platform, tagged 6.5.2, are now available:

Docker Image	Component	More Information
`openam:6.5.2`	AM 6.5.2	*ForgeRock Access Management Release Notes*
`ds:6.5.2`	DS 6.5.2	*ForgeRock Directory Services Release Notes*
`openidm:6.5.2`	IDM 6.5.0[a]	*ForgeRock Identity Management Release Notes*
`openig:6.5.2`	IG 6.5.2	*ForgeRock Identity Gateway Release Notes*

[a] The `openidm:6.5.2` Docker image contains IDM 6.5.0, which is the most current version of IDM.

1.2. New Docker Registry

ForgeRock's public Docker registry has moved from Bintray to Google Container Registry. Docker images for the ForgeRock Identity Platform will no longer be available on Bintray after March 31, 2019. For the new locations of the ForgeRock Identity Platform Docker images, see "Using the Evaluation-Only Docker Images" in the *DevOps Developer's Guide*.

1.3. New DevOps Features in Version 6.5

ForgeRock Identity Platform 6.5 is a major release that introduces new features, functional enhancements, and fixes.

Cloud Deployment Model (CDM) artifacts and documentation

The CDM, completely new in version 6.5, demonstrates a common use ForgeRock Identity Platform architecture installed on Kubernetes.

The `forgeops` repository contains the CDM deployment artifacts. Dockerfiles, Helm charts, and example scripts help you deploy the CDM on Google Kubernetes Engine (GKE), Amazon Elastic Kubernetes Service (EKS), Microsoft Azure Kubernetes Service (AKS), and RedHat OpenShift running on Amazon Web Services.

The following new guides describe the CDM deployment and its behaviors, and provide steps for replicating the model:

- Cloud Deployment Model Cookbook for GKE
- Cloud Deployment Model Cookbook for Amazon EKS
- Cloud Deployment Model Cookbook for AKS (Evaluation Edition)

Be sure to read "About This Evaluation Edition" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* for information about limitations in the AKS version of the CDM.

The following new guides describe customizing the CDM to meet your organization's needs:

- Site Reliability Guide for GKE
- Site Reliability Guide for Amazon EKS

Helm chart for configuration repository details

The new `frconfig` Helm chart deploys configuration items used by other pods in a ForgeRock deployment:

- The configuration repository's URL
- The configuration repository branch that contains the AM, IDM, and IG configurations
- The private key needed to access the configuration repository
- A signing certificate that the certificate manager uses to create an SSL certificate to secure communication with ForgeRock services

You can install more than one `frconfig`-like chart. Installing multiple charts is useful if you want your deployment to obtain ForgeRock component configurations from multiple configuration repositories.

For information about how to deploy the `frconfig` Helm chart, see "Installing the frconfig Helm Chart" in the *DevOps Developer's Guide*.

For information about using multiple configuration repositories, see the commented `values.yaml` file for the `frconfig` Helm chart in the `forgeops` repository.

`downloader` Docker image

The method for building Docker images has changed in version 6.5. The `downloader` image, which automatically downloads ForgeRock binaries, now serves as the base image for the `openam`, `amster`, `openidm`, `openig`, and `ds` Docker images.

With the ForgeRock Docker images using the `downloader` image as their base image, you no longer need to manually download the binary files from ForgeRock before you build Docker images.

For more information, see "*Building and Pushing Docker Images*" in the *DevOps Developer's Guide*.

Communication to ForgeRock Identity Platform services is HTTPS-only

In version 6.5, all communication to ForgeRock Identity Platform services is over HTTPS. You can secure communication by using any of the following:

- A self-signed certificate
- A certificate with a trust chain that starts at a trusted root certificate
- A certificate obtained dynamically from Let's Encrypt

For more information, see "About Securing Communication With ForgeRock Services" in the *DevOps Developer's Guide*.

debug-logs.sh script

The new **debug-logs.sh** script generates the following HTML-formatted output, which you can view in a browser:

- Descriptions of all the Kubernetes pods running the ForgeRock Identity Platform in your namespace
- Logs for all of the containers running in these pods

For more information, see "Running the debug-logs.sh Script" in the *DevOps Developer's Guide*.

The AM configuration, policies, and application data reside in the configuration store

In AM 6.5, you can maintain policies and application data in their own external data stores.

In the DevOps Examples and CDM, policies and application data reside in the configuration store rather than in separate data stores.

1.4. Technology Preview

A technology preview of upcoming features that greatly simplify configuration and deployment is available in the `skaffold-6.5` branch of the `forgeops` repository.

Important

This technology preview helps you familiarize yourself with upcoming changes to techniques used in ForgeRock DevOps deployments. **Do not use the technology preview for production deployments**.

Read *Deploying the ForgeRock Platform on Kubernetes using Skaffold and Kustomize* for more information about the upcoming technology changes, and the reasons for the changes.

The technology preview includes the following new features:

Docker images include the AM and IDM configuration

In the technology preview, the AM and IDM configurations are incorporated into the `openam` and `openidm` Docker images.

This differs from version 6.5. In version 6.5, these configurations are stored in an external Git repository known as the configuration repository. Because the configurations are now incorporated into Docker images, the configuration repository is not used in the technology preview.

Skaffold framework support

The `skaffold-6.5` branch contains new artifacts that let you deploy the ForgeRock Identity Platform using the Skaffold framework. Deploying with Skaffold lets you:

- Quickly and easily start the ForgeRock Identity Platform.
- Modify the AM and IDM configurations.
- Build updated Docker images that include your configuration changes.
- Restart the ForgeRock Identity Platform with the updated Docker images.

Before you can use Skaffold with ForgeRock Identity Platform, you'll need to install Skaffold software on your local computer. See the technology preview documentation for more information.

Kustomize framework support

The technology preview uses the Kustomize framework to orchestrate AM, DS, and IDM on Kubernetes. You do not use Helm charts to orchestrate the ForgeRock Identity Platform.

Before you can use the Kustomize framework with ForgeRock Identity Platform, you'll need to install Kustomize software on your local computer. See the technology preview documentation for more information.

The ForgeRock Cloud Developer's Kit

The technology preview documentation uses the term *Cloud Developer's Kit* to describe what is referred to as the DevOps Examples in current versions of the documentation.

For more information about the Cloud Developer's Kit, see:

- "Cloud Developer's Kit (CDK)" in the *Technology Preview: Start Here* Guide
- "*About the Cloud Developer's Kit*" in the *Technology Preview: Using Minikube*

Technology preview documentation

The following new documentation supports the technology preview:

- Technology Preview: Start Here
- Technology Preview: Using Minikube
- Technology Preview: Using a Shared Cluster

Chapter 2
Before You Deploy

This chapter covers software prerequisites for deploying and running the DevOps Examples and the CDM.

2.1. About the DevOps Repositories on GitHub

The ForgeRock DevOps Examples and CDM use the following two Git repositories:

- `forgeops`
- `forgeops-init`

You must obtain these Git repositories before you can use the DevOps Examples or the CDM.

This section describes the repositories' content and how to get them.

2.1.1. forgeops Repository

The `forgeops` repository repository contains:

- Dockerfiles and other artifacts for building Docker images
- Helm charts and Kubernetes manifests for orchestrating the DevOps Examples and the CDM
- Utility scripts

Deploying the DevOps Examples and the CDM requires minor modifications to the `forgeops` repository.

Perform the following steps to obtain the `forgeops` repository:

To Obtain the forgeops Repository

The `forgeops` repository is a public Git repository. You do not need credentials to clone it:

1. Clone the `forgeops` repository:
   ```
   $ git clone https://github.com/ForgeRock/forgeops.git
   ```
2. Check out the `release/6.5.2` branch:

```
$ cd forgeops
$ git checkout release/6.5.2
```

2.1.2. forgeops-init Repository

The `forgeops-init` repository is the basis for a *configuration repository*.

When you deploy the ForgeRock Identity Platform in a DevOps environment, the AM, IDM, and IG configurations are retrieved from JSON files. The JSON files are stored in a cloud-based Git configuration repository.

The `forgeops-init` repository contains:

- Sets of JSON files that define sample configurations for AM, IDM, and IG
- `README` files that contain detailed information about:
  - The structure of the repository
  - Each sample configuration in the repository

Before you can deploy the ForgeRock Identity Platform in a DevOps environment, you must duplicate, fork, or use the `forgeops-init` repository. For more information, see "Creating Your Configuration Repository" in the *DevOps Developer's Guide*.

2.2. Installing Required Third-Party Software

Before installing the ForgeRock Identity Platform, you must obtain non-ForgeRock software and install it on your local computer.

The DevOps Examples and the CDM have been validated with the third-party software versions listed in this section. They *might* also work with older or newer versions of the software.

Tables in the following sections list validated software versions, and indicate whether each version is *stable* or *leading edge*. Choose software versions based on the type of environment you want to create:

- **Stable environment**. When system stability is a higher priority than running the latest software, create a stable environment. In stable environments, third-party software versions have been tested with the DevOps Examples and CDM 6.5 prior to their release.
- **Leading edge environment**. When running the latest software is a higher priority than system stability, create a leading edge environment. The DevOps Examples and CDM 6.5 have been successfully installed *but not fully tested* on leading edge versions of third-party software.

  Note that if no leading edge version is identified in the tables for a given third-party software product, use the stable version even when creating a leading edge environment.

2.2.1. Software Requirements for All Environments

Install the software listed in the following table on your local computer:

Software	Version	URL for More Information
Docker Desktop[a]	2.1.0.2	https://www.docker.com/products/docker-desktop
Docker client (Linux)	18.09.0 (stable), 18.09.07 (leading edge)	https://docs.docker.com/install/linux/docker-ce/binaries
Kubernetes client (**kubectl**)	1.16.0	https://kubernetes.io/docs/tasks/kubectl/install
Kubernetes Helm	2.11.0 (stable), 2.14.2 (leading edge)	https://github.com/helm/helm
Kubernetes context switcher (**kubectx**)	0.7.0	https://github.com/ahmetb/kubectx
Kubernetes log display utility (**stern**)	1.11.0	https://github.com/wercker/stern

[a] Docker Desktop is available for Windows and macOS only. On Linux computers, install Docker CE instead. For more information, see the Docker documentation.

2.2.2. Software Requirements for Minikube Environments

Minikube is the only supported local environment for the DevOps Examples. The CDM is not supported on local environments; it runs in cloud environments only.

Before implementing the DevOps Examples in a local environment, you must install the software listed in "Software Requirements for All Environments" on your computer. You must also install the software listed in the following table on your computer:

Software	Version	URL for More Information
VirtualBox	6.0.12[a]	https://www.virtualbox.org/wiki/downloads
Minikube	1.4.0	http://kubernetes.io/docs/getting-started-guides/minikube

[a]On Windows computers, do not install VirtualBox. Instead, enable Hyper-V.

2.2.2.1. Required Workaround for Minikube Environments

To run the DevOps Examples successfully on Minikube, you must work around Minikube issue 1568. Run the following command *every time you restart the Minikube virtual machine* to enable pods deployed on Minikube to be able to reach themselves on the network:

```
$ minikube ssh sudo ip link set docker0 promisc on
```

2.2.3. Software Requirements for GKE Environments

GKE is a supported cloud-based environment for running the DevOps Examples and the CDM.

Before implementing the DevOps Examples and the CDM in a GKE environment, you must install the software listed in "Software Requirements for All Environments" on your computer. You must also install the software listed in the following table on your local computer:

Software	Version	URL for More Information
Google Cloud SDK	263.0.0	https://cloud.google.com/sdk/downloads

2.2.4. Software Requirements for Amazon EKS Environments

EKS is a supported cloud-based environment for running the DevOps Examples and the CDM.

Before implementing DevOps Examples and the CDM in an Amazon EKS environment, you must install the software listed in "Software Requirements for All Environments" on your computer. You must also install the software listed in the following table on local computer:

Software	Version	URL for More Information
Amazon AWS Command Line Interface	1.16.240	https://docs.aws.amazon.com/cli/latest/userguide/awscli-install-bundle.html
AWS IAM Authenticator for Kubernetes	0.4.0	https://docs.aws.amazon.com/eks/latest/userguide/getting-started.html

After you install the `aws-iam-authenticator` binary, ensure that the binary is executable and is in the `PATH`.

2.2.5. Software Requirements for AKS Environments

Before implementing DevOps Examples and the CDM in an AKS environment, you must install the software listed in "Software Requirements for All Environments" on your computer. You must also install the software listed in the following table on your local computer:

Software	Version	URL for More Information
Azure Command Line Interface	2.0.55	https://docs.microsoft.com/en-us/cli/azure/install-azure-cli?view=azure-cli-latest

2.2.6. Software Requirements for Minishift

Before implementing DevOps Examples in a Minishift environment, you must install the software listed in "Software Requirements for All Environments" on your computer. You must also install the software listed in the following table on your local computer:

Software	Version	URL for More Information
Minishift	1.34.0 (stable), 1.34.0 (leading edge)	https://docs.okd.io/latest/minishift/getting-started/installing.html

2.3. Choosing the Kubernetes Version

Kubernetes versions are expressed as *x.y.z*, where *x* is the major version, *y* is the minor version, and *z* is the patch version.

The DevOps Examples and the CDM have been validated with the minor versions listed in this section. All patch versions within a minor version are supported.

Platform	Kubernetes Version
GKE	1.14
Amazon EKS	1.11
AKS	1.12
Minikube on VirtualBox	1.15.0
Minikube on Hyper-V	1.11

Chapter 3
Upgrading

Before upgrading from version 6.0 to version 6.5 of the DevOps Examples, read "*What's New*" and "*Changes and Deprecated Functionality*" for information about new, changed, and removed features.

Then perform the following general steps, as needed:

1. Update to newer versions of third-party software.

   See "Installing Required Third-Party Software" for supported third-party software versions.

2. Delete existing clones of the `forgeops` repository, and then reclone the `forgeops` repository.

   For more information, see "forgeops Repository".

3. Start with a new Kubernetes namespace.

   Before attempting to deploy the DevOps Examples 6.5, create a new namespace.

   For more information, see the pertinent sections in "*Implementing DevOps Environments*" in the *DevOps Developer's Guide*.

4. Rebuild and push your Docker images.

   If you are not using the evaluation-only Docker images from ForgeRock's public Docker registry, build new Docker images with updated ForgeRock binaries, and then push them to your Docker registry.

   Note that the method for building Docker images has changed in version 6.5. The `downloader` image, which automatically downloads ForgeRock binaries, now serves as the base image for other ForgeRock Docker images.

   See "*Building and Pushing Docker Images*" in the *DevOps Developer's Guide* for more information.

5. Upgrade AM and IDM configurations in your configuration repository.

   For more information, see the following sections in the ForgeRock documentation:

   - *ForgeRock Access Management Upgrade Guide*
   - Updating Servers in the *ForgeRock Identity Management Installation Guide*

6. Reorganize your `custom.yaml` files.

For version 6.5, specify custom values for deploying the DevOps Examples in separate `.yaml` files for each component rather than in a single `custom.yaml` file.

Review the recommendations for `.yaml` files in the following sections, and reorganize your `.yaml` files accordingly:

- "Installing the frconfig Helm Chart" in the *DevOps Developer's Guide*
- "To Create .yaml Files for Installing DS Servers Used in the AM and DS Example" in the *DevOps Developer's Guide*
- "To Create .yaml Files for Deploying AM and Amster" in the *DevOps Developer's Guide*
- "To Create a .yaml File for Installing the DS Server Used in the IDM Example" in the *DevOps Developer's Guide*
- "To Create a .yaml File for Deploying IDM" in the *DevOps Developer's Guide*
- "To Create .yaml Files for Deploying IG" in the *DevOps Developer's Guide*
- "YAML File Reference" in the *DevOps Developer's Guide*

7. Install separate Helm charts for the AM and IDM examples instead of composite Helm charts.

   For version 6.5, the `cmp-am-dj` and `cmp-idm-dj-postgres` Helm charts have been removed from the `forgeops` repository.

   Additionally, the `forgerock-charts` Helm repository is no longer available.

   Change AM deployments to install the `openam`, `amster`, and several `ds` Helm charts from your `forgeops` repository clone.

   Change IDM deployments to install the `openidm`, `ds`, and `postgres-openidm` Helm charts from your `forgeops` repository clone.

   Change IG deployments to install the `openig` Helm chart from your `forgeops` repository clone.

   For more information, see the following sections:

   - "To Install the DS Servers' Helm Charts" in the *DevOps Developer's Guide*
   - "To Install the AM and Amster Helm Charts" in the *DevOps Developer's Guide*
   - "To Install the DS Server's Helm Chart" in the *DevOps Developer's Guide*
   - "To Install the PostgreSQL Server's Helm Chart" in the *DevOps Developer's Guide*
   - "To Install the IDM Helm Chart" in the *DevOps Developer's Guide*
   - "To Install the IG Helm Chart" in the *DevOps Developer's Guide*

8. If necessary, revise your **customize-am.sh** script.

   The **customize-am.sh** script, described in "Customizing the AM Web Application" in the *DevOps Developer's Guide*, lets you customize the AM web container before AM starts.

   See *Environment variables available to the **customize-am.sh** script have changed* in "Changes to Existing Functionality" for more information.

9. Revise your secure communication configuration.

   Communication to ForgeRock Identity Platform services is now secured by a certificate created by the certificate manager. For more information, see "About Securing Communication With ForgeRock Services" in the *DevOps Developer's Guide*.

10. Copy your configuration repository's private key into the `frconfig` Helm chart.

    The Kubernetes secret that contains the configuration repository's private key is now built dynamically. The private key must be copied into the `frconfig` Helm chart before you install this chart. For more information, see "About the Configuration Repository's Private Key" in the *DevOps Developer's Guide*.

Chapter 4

Changes and Deprecated Functionality

This appendix covers changed, deprecated, and removed features in version 6.5.

4.1. Changes to Existing Functionality

This following changes to existing functionality were made in version 6.5:

Composite Helm charts for the AM and IDM examples are no longer available.

In version 6.5, the composite Helm charts for the AM and IDM examples have been removed from the `forgeops` repository. Now you install Helm charts for each required ForgeRock Identity Platform component. This change simplifies deployment troubleshooting.

For more information, see the following sections:

- "To Install the DS Servers' Helm Charts" in the *DevOps Developer's Guide*
- "To Install the AM and Amster Helm Charts" in the *DevOps Developer's Guide*
- "To Install the DS Server's Helm Chart" in the *DevOps Developer's Guide*
- "To Install the PostgreSQL Server's Helm Chart" in the *DevOps Developer's Guide*
- "To Install the IDM Helm Chart" in the *DevOps Developer's Guide*

Note that the `cmp-am-platform` composite Helm chart remains in the `forgeops` repository for deploying the example in the DevOps Quick Start Guide. Do not use this Helm chart for purposes other than to get started with the DevOps Examples.

The `forgerock-charts` Helm repository is no longer available.

In previous versions, Helm charts were installed from the `forgerock-charts` Helm repository.

This Helm repository is no longer available. In version 6.5, install Helm charts from your clone of the `forgeops` repository.

The ForgeRock Docker images have been moved to a new location.

ForgeRock's public Docker repository is now available on Google Container Registry. Docker images for the ForgeRock Identity Platform will no longer be available on Bintray after March

31, 2019. For the new locations of the ForgeRock Docker images, see "Using the Evaluation-Only Docker Images" in the *DevOps Developer's Guide*.

`forgeops` repository artifacts have been renamed.

In version 6.5, the `opendj` Helm chart and Docker image have both been renamed to `ds`.

All configurations in the `forgeops-init` repository reside in the `master` branch.

All of the example ForgeRock Identity Platform configurations in the `forgeops-init` repository now reside in the `master` branch. Branches named after ForgeRock Identity Platform release numbers are no longer used. For example, there is no `release/6.5.2` branch.

The `master` branch contains a directory for each ForgeRock Identity Platform release with example configuration. For example, the `6.5` directory contains configurations for ForgeRock Identity Platform version 6.5.

For more information, see the `forgeops-init` repository README file.

`.yaml` file properties have been modified and reorganized.

Instead of specifying custom values for deploying the DevOps Examples or the CDM in a single `custom.yaml` file, use separate `.yaml` files for each component.

For more information about `.yaml` file revisions, see the following sections:

- "Installing the frconfig Helm Chart" in the *DevOps Developer's Guide*
- "To Create .yaml Files for Installing DS Servers Used in the AM and DS Example" in the *DevOps Developer's Guide*
- "To Create .yaml Files for Deploying AM and Amster" in the *DevOps Developer's Guide*
- "To Create a .yaml File for Installing the DS Server Used in the IDM Example" in the *DevOps Developer's Guide*
- "To Create a .yaml File for Deploying IDM" in the *DevOps Developer's Guide*
- "To Create .yaml Files for Deploying IG" in the *DevOps Developer's Guide*
- "YAML File Reference" in the *DevOps Developer's Guide*

The method for configuring secure communication has changed.

Communication to ForgeRock Identity Platform services is now secured by a certificate created by the certificate manager. For more information, see "About Securing Communication With ForgeRock Services" in the *DevOps Developer's Guide*.

Obtaining and storing SSL certificates is now managed by the Kubernetes certificate manager add-on.

In previous versions of the DevOps Examples, you were required to manage the process of obtaining SSL certificates and storing them as Kubernetes secrets.

In version 6.5, the DevOps Examples and the CDM use the Kubernetes certificate manager add-on to automate that process.

For more information, see "About the Configuration Repository's Private Key" in the *DevOps Developer's Guide*.

Environment variables available to the customize-am.sh script have changed.

The **customize-am.sh** script, described in "Customizing the AM Web Application" in the *DevOps Developer's Guide*, lets you customize the AM web container before AM starts.

The set of environment variables that can be accessed by the **customize-am.sh** script has changed in version 6.5.

If you use the **customize-am.sh** script in an existing AM deployment, review your script before orchestrating version 6.5 of the DevOps Examples as follows:

1. If you have not already done so, include the **env** command in your script, as shown in the example script in "Customizing the AM Web Application" in the *DevOps Developer's Guide*.
2. Orchestrate AM.
3. Review the logs from the `openam` container in the `openam` pod. Use a command similar to the following:

```
$ kubectl logs openam-xxxxxxxxxx-yyyyy -c openam
```

The *DevOps Developer's Guide* has been renamed.

The *DevOps Developer's Guide* has been renamed to the DevOps Developer's Guide.

IDM is deployed using a `StatefulSet` object.

In version 6.5, the `openidm` pod is deployed using a `StatefulSet` object to achieve greater stability.

In previous releases, the IDM pod was deployed using a `Deployment` object.

The IDM configuration is read-only (immutable) by default.

IDM 6.5 includes a new option for making its configuration read-only. By default, the DevOps Examples and the CDM run with read-only configuration for IDM.

Set the `openidm` Helm chart's `config.immutable` key to `false` to make IDM's configuration read/write.

For more information, see "openidm.yaml" in the *DevOps Developer's Guide*.

The IG example runs in production mode.

In version 6.5, IG deployments are configured with read-only configuration. The IG documentation refers to read-only configuration as *production mode*.

Note that IG Studio is not available for IG production mode deployments. In previous releases of the DevOps Examples, IG ran in development mode, and IG Studio was available.

The default AM server URL has changed.

In version 6.5, the default AM server URL is now https://login.*my-namespace*.example.com.

In previous versions of the DevOps Examples, the default AM server URL was http://openam.*my-namespace*.example.com/openam.

4.2. Deprecated Features

The following features are deprecated in version 6.5 of the DevOps Examples:

`sedFilter` key in the `openidm` Helm chart

Support for using the `sedFilter` key in the `openidm` Helm chart is deprecated.

After issue OPENIDM-11529 has been resolved, you will be able to use IDM configuration expressions for pattern substitution. At that time, support for the `sedFilter` key will be removed from all Helm charts in the DevOps Examples.

4.3. Removed Features

The following features have been removed from version 6.5 of the DevOps Examples:

AM and IDM composite Helm charts

The `cmp-am-dj` and `cmp-idm-dj-postgres` Helm charts have been removed from the `forgeops` repository. Instead of installing these Helm charts, install one or more non-composite charts.

For more information, see the following sections:

- "To Install the DS Servers' Helm Charts" in the *DevOps Developer's Guide*
- "To Install the AM and Amster Helm Charts" in the *DevOps Developer's Guide*
- "To Install the DS Server's Helm Chart" in the *DevOps Developer's Guide*
- "To Install the PostgreSQL Server's Helm Chart" in the *DevOps Developer's Guide*
- "To Install the IDM Helm Chart" in the *DevOps Developer's Guide*

`numberSampleUsers` key in the ds Helm chart

The `numberSampleUsers` key is no longer used to specify an initial number of sample users to be created in DS directories. Instead, the `ds` Docker image is pre-built with a small number of sample user entries.

If you need a larger number of sample user entries in your DS directories, create a customized Docker DS image.

`useTLS` key in several Helm charts

The `useTLS` key is no longer supported. Communication to ForgeRock Identity Platform services is now secured by a certificate created by the certificate manager. For more information, see "About Securing Communication With ForgeRock Services" in the *DevOps Developer's Guide*.

`sedFilter` key in the `openam` and `openig` Helm charts

The `sedFilter` key is no longer supported in the `openam` and `openig` Helm charts. Use AM and IG configuration expressions to substitute text in a configuration instead of specifying a `sedFilter` Helm chart key.

Note that the `sedFilter` key in the `openidm` Helm chart is deprecated.

Chapter 5
Limitations

This chapter covers release 6.5 limitations.

5.1. DS Limitations

DS live data and logs should reside on fast disks.

DS data requires high performance, low latency disk. Use external volumes on solid-state drives (SSDs) for directory data when running in production. Do not use network file systems such as NFS except for storing directory backups.

DS does not scale elastically.

DS does not support elastic scaling. Be sure to design your DS deployment architecture carefully, with this limitation in mind.

The dsreplication command cannot run in a container.

The **dsreplication** command does not support configuration expressions, which are used by artifacts in the `forgeops` repository. Therefore, do not execute the **dsreplication** command in a Kubernetes pod. For more information, see Setting Up Replication in the *Directory Services Deployment Guide*.

As a result, you cannot use the **dsreplication status** command to obtain diagnostic information about replication when running DS in a Kubernetes pod. Instead, use one of the following techniques:

- **Monitor replication using Prometheus**. Grafana charts display the number of replicated and unreplicated updates, and the replication delay for each replica.
- **Query the `cn=monitor` entry**. For more information, see LDAP-Based Monitoring in the *Directory Services Administration Guide*.

The DS restore command must be used if you need to recover DS directory data.

You cannot use the **dsreplication** command with a DS instance in a replication topology, because the command cannot run using configuration expressions for property value substitution. To restore directory data, use the DS **restore** command. For information about restoring directory data from a backup in a DevOps environment, see "Using CDM Restore" in the *Site Reliability Guide for GKE*.

Fully test your backup and recovery procedures before deploying DS in a production DevOps environment. Failure to do so might result in data loss.

Caution

Deploy DS as Kubernetes stateful sets only if:

- You are highly experienced and extremely skilled in Kubernetes deployment. DS is a specialized distributed database. Deploying DS on Kubernetes requires a deep knowledge of both DS and Kubernetes.
- You plan to deploy DS following the ForgeRock documentation. Any deviation from our prescriptive documentation on deploying DS on Kubernetes could cause instability in the deployment, and might impair ForgeRock's ability to support you.
- You understand that the current pattern for deploying DS, unlike other ForgeRock components, is not elastic.
- You have read the limitations in this section and understand you might need to work around them.

Unless you have experience deploying both DS and Kubernetes stateful sets in production, ForgeRock recommends that you *not* deploy DS using Kubernetes stateful sets in production deployments. Instead, deploy DS in virtual machines on cloud platforms to support ForgeRock Identity Platform deployments with AM and IDM running in Kubernetes.

We strongly recommend that you review the following with a ForgeRock technical consultant or a ForgeRock certified partner before deploying DS containers in production:

- Your overall requirements.
- Your DS services design.
- Your strategy for testing functionality and performance.

5.2. AM Limitations

Several AM operations are stateful and require session stickiness.

Several operations in AM are stateful, requiring flows to return to the same server instance several times. For example, browser-based authentication that uses authentication chains, and some SAML flows, are stateful operations. If your deployment uses any stateful AM operations, you *must* configure your load balancer to use sticky sessions.

Even if your deployment does not use any stateful AM operations, it is recommended that you configure your load balancer to use sticky sessions to achieve better performance.

A subset of AM's full SAML v2.0 functionality does not work correctly in containers.

When implementing AM SAML v2.0 in containers:

- Enable session stickiness on the ingress controller.

- For SAML v2.0 single sign-on with the HTTP-Artifact binding, use SAML v2.0 failover.
- For SAML v2.0 single logout, use the HTTP-POST or HTTP-Redirect bindings. The SOAP binding is *not* supported when AM runs in a container.

5.3. IDM Limitations

There are no limitations for this release.

5.4. IG Limitations

There are no limitations for this release.

5.5. DevOps Examples Limitations

Docker images are not available for use in production deployments.

Docker images for use in production deployments of the ForgeRock Identity Platform are not available. Unsupported, evaluation-only images are available from ForgeRock's public Docker registry. These images can be used *for evaluation purposes only*. For more information, see "*Building and Pushing Docker Images*" in the *DevOps Developer's Guide*.

When deploying ForgeRock Identity Platform in production, you must build Docker images. For more information about building images for the ForgeRock Identity Platform, see "*Building and Pushing Docker Images*" in the *DevOps Developer's Guide*.

Docker images with the ssoadm command are not available.

The DevOps Examples do not include example deployments of the AM **ssoadm** command. However, you can use the AM REST API and the **amster** command with the AM and DS deployment example.

The IDM repository is not configured for high availablity.

The IDM repository configuration used with the DevOps Examples is not suitable for production deployments. When running IDM in production, configure your repository for high availability. For more information about ensuring high availability of the identity management service, see Clustering, Failover, and Availability in the *ForgeRock Identity Management Integrator's Guide*.

Chapter 6
Documentation Updates

The following changes have been made to the documentation since the release of 6.5 of the DevOps Examples and the CDM:

Date	Description

2019-12-03	Changed the CDM's monitoring infrastructure to use a newer version of the Prometheus operator:
	• Revised the procedure to deploy monitoring infrastructure. See:
	  • "To Deploy CDM Monitoring Tools" in the *Cloud Deployment Model Cookbook for GKE*
	  • "To Deploy CDM Monitoring Tools" in the *Cloud Deployment Model Cookbook for Amazon EKS*
	  • "To Deploy CDM Monitoring Tools" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)*
	• Revised pod names and other details in the sections on customizing monitoring. See:
	  • "*Monitoring Your Deployment*" in the *Site Reliability Guide for GKE*
	  • "*Monitoring Your Deployment*" in the *Site Reliability Guide for Amazon EKS*

2019-10-16	Added documentation to support a technology preview of upcoming features. The technology preview supports the Skaffold framework, and replaces Helm charts with Kustomize bases and overlays. In addition, instead of using a Git-based configuration repository to store custom AM and IDM configurations, the Docker images for AM and IDM now include their configurations. When you customize AM and IDM, you must also rebuild their Docker images, including your configuration changes. For more information about how to deploy the Platform using the technology preview, see: • Technology Preview: Start Here • Technology Preview: Using Minikube • Technology Preview: Using a Shared Cluster

Date	Description
2019-09-04	Corrected the tag of the `downloader` Docker image in the **docker build** command in "To Build the ForgeRock downloader Docker Image" in the *DevOps Developer's Guide*. (The correct tag is `latest`.)
2019-08-21	Added the "Third-Party Kubernetes Services" section to the *Getting Support* appendix. This appendix, which appears at the end of every book in the ForgeRock DevOps documentation, provides information about getting support from ForgeRock for DevOps deployments. Added the `--enable-ip-alias` flag to the cluster creation example commands in "Creating the Cluster" in the *Cloud Deployment Model Cookbook for GKE*.
2019-08-02	The documentation has been updated to support version ForgeRock Identity Platform 6.5.2. Version 6.5.0 and 6.5.1 Dockerfiles and Helm charts are no longer supported. Instead, use the following artifacts: • Dockerfiles and Helm charts in the `release/6.5.2` branch of the `forgeops` repository • Docker images tagged with `6.5.2` Third-party software deployed with the CDM is now listed in: • "Third-Party Software Deployed With the CDM" in the *Cloud Deployment Model Cookbook for GKE* • "Third-Party Software Deployed With the CDM" in the *Cloud Deployment Model Cookbook for Amazon EKS* • "Third-Party Software Deployed With the CDM" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* Updated versions of third-party software are listed in "Installing Required Third-Party Software". Revised the way to obtain the Kubernetes cluster version for GKE. See "Creating the Cluster" in the *Cloud Deployment Model Cookbook for GKE*. Added a step to update the S3 bucket policy to block public access. See "Creating an Amazon S3 Bucket Policy" in the *Cloud Deployment Model Cookbook for Amazon EKS*.
2019-07-21	The new Getting Started on Minishift guide provides a quick introduction to getting AM and IDM running on Minishift.
2019-06-21	Changed all examples in the documentation to use supported versions of Kubernetes. Previously, several examples did not specify a version. Following those examples created clusters at the latest version of Kubernetes instead of at supported versions. Added information about how to restrict access to AWS worker nodes from a specific IP address or a range of IP addresses. Restricting access is done on the ingress controller. See "Controlling Access by Configuring a CIDR Block" in the *Site Reliability Guide for Amazon EKS*.

Date	Description
	Corrected the machine type in the example command to create a medium CDM cluster on GKE. See "To Create a Kubernetes Cluster for CDM" in the *Cloud Deployment Model Cookbook for GKE*. Added a bullet point about obtaining the AMI ID when creating EKS worker nodes. See "To Create Amazon EKS Worker Nodes" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Fixed a typo in the **aws iam list-groups-for-user** command that gets users' group memberships. See "To Create a Virtual Private Cloud" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Simplified the steps for mounting the EFS file system on worker nodes. The new technique uses a new storage class, `nfs`. See "To Mount the EFS Filesystem on Worker Nodes" in the *Cloud Deployment Model Cookbook for Amazon EKS* and "Creating Storage Classes" in the *Cloud Deployment Model Cookbook for Amazon EKS*.
2019-05-10	Added important cautions about deploying DS as Kubernetes stateful sets. See "DS Limitations". Added notes about cloud provider roles and permissions required to deploy the CDM. See: • "To Configure a GCP Project for the CDM" in the *Cloud Deployment Model Cookbook for GKE* • "Granting Permissions to Configure CDM Resources" in the *Cloud Deployment Model Cookbook for Amazon EKS* • "To Configure an Azure Subscription for the CDM" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* Updated the Kubernetes cluster version for ForgeRock Identity Platform deployments on Azure Kubernetes Service to 1.12. Removed the Apache and NGINX Agent examples from "New DevOps Features in Version 6.5". Note that these two examples are no longer available in the `forgeops` repository. Added introductory chapters to the Site Reliability Guides: • "*Engineering ForgeRock Site Reliability*" in the *Site Reliability Guide for GKE* • "*Engineering ForgeRock Site Reliability*" in the *Site Reliability Guide for Amazon EKS* Corrected the AM console URL in "To Access the AM Console" in the *DevOps Developer's Guide*. Added a step to retrieve the `amadmin` user's password to "To Access ForgeRock Identity Platform Web User Interfaces" in the *DevOps Quick Start Guide*. Added a new procedure to grant access to an Amazon EKS cluster to multiple AWS users. See "Granting Access to Multiple Users" in the *Site Reliability Guide for Amazon EKS*.

Date	Description
	Added a step to set the Azure subscription ID before deploying the CDM to "To Configure an Azure Subscription for the CDM" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)*. Added a new procedure to set the Kubernetes context to an Azure cluster. See "To Set up Your Kubernetes Context on AKS" in the *DevOps Developer's Guide*.
2019-03-29	The documentation has been updated to support version ForgeRock Identity Platform 6.5.2. Version 6.5.0 Dockerfiles and Helm charts are no longer supported. Instead, use the following artifacts: • Dockerfiles and Helm charts in the `release/6.5.2` branch of the `forgeops` repository • Docker images tagged with `6.5.2` ForgeRock's public Docker registry is moving from Bintray to Google Container Registry. Docker images for the ForgeRock Identity Platform will no longer be available on Bintray after March 31, 2019. For the new locations of the ForgeRock Identity Platform Docker images, see "Using the Evaluation-Only Docker Images" in the *DevOps Developer's Guide*. Information about changing hardcoded passwords in the `forgeops` repository has been added to the Site Reliability Guides: • "Changing Default Secrets" in the *Site Reliability Guide for GKE* • "Changing Default Secrets" in the *Site Reliability Guide for Amazon EKS* The restriction against implementing SAML v2.0 single sign-on (SSO) and single logout (SLO) when running AM in a container has been updated. For more information, see "AM Limitations".
2019-03-08	"Installing Required Third-Party Software" now lists software versions of supporting components for stable and leading edge environments: • **Stable environment**. Includes software versions that were used when testing the DevOps Examples and CDM 6.5. Use when stability is a higher priority than running the latest software. • **Leading edge environment**. Includes software versions that were not available when the DevOps Examples and CDM 6.5 were released. The DevOps Examples 6.5 have been installed but not fully tested in leading edge environments. Use when running the latest software is a higher priority than stability. Be aware that you might run into issues when deploying in a leading edge environment. The new section "Choosing the Kubernetes Version" lists Kubernetes versions on which the DevOps Examples and the CDM have been validated. The password for the `amadmin` user is no longer set to `password` by default. Instead, it's generated randomly. For information about how to obtain the password, see "To Access the AM Console" in the *DevOps Developer's Guide*. Made several corrections to the procedures for setting up an EKS environment for running CDM:

Date	Description
	• Added a step to grant permissions for worker nodes to access the EFS file system. See "To Create an Amazon EFS File System" in the *Cloud Deployment Model Cookbook for Amazon EKS*. • Changed the way the Amazon S3 bucket is created. See "To Create an Amazon S3 Bucket Policy" in the *Cloud Deployment Model Cookbook for Amazon EKS*. • Added a step to remove the automatically-created `gp2` storage class, which is not used. See "To Create Storage Classes" in the *Cloud Deployment Model Cookbook for Amazon EKS*. • Added a new procedure, "To Mount the EFS Filesystem on Worker Nodes" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Added details about deploying the CDM in different regions from the regions the Cloud Deployment Team used. See: • "Setting up a GCP Project for the CDM" in the *Cloud Deployment Model Cookbook for GKE* • "Creating a Virtual Private Cloud" in the *Cloud Deployment Model Cookbook for Amazon EKS* • "Setting Up an Azure Subscription for the CDM" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* Corrected the commands for installing the `kube-prometheus` and `forgeops-metrics` Helm charts. The `--name` argument was missing from the commands. See: • "Deploying Monitoring Infrastructure" in the *Cloud Deployment Model Cookbook for GKE* • "Deploying Monitoring Infrastructure" in the *Cloud Deployment Model Cookbook for Amazon EKS* • "Deploying Monitoring Infrastructure" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* Changed the way that static public IP addresses are reserved for AKS clusters. See: • "Setting Up an Azure Subscription for the CDM" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* • "Assigning the Network Contributor Role to the Service Principal" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* Alternate methods for getting information obtained by running the **dsreplication status** command are now listed in "DS Limitations".
2019-02-14	Added a step in "Creating a Virtual Private Cloud" in the *Cloud Deployment Model Cookbook for Amazon EKS* to set the default AWS region to `us-east-1`.
2019-02-08	The new Cloud Deployment Model Cookbook for AKS (Evaluation Edition) provides information about how to deploy the CDM on Microsoft Azure Kubernetes Service

Date	Description
	(AKS). Deploying on AKS is for evaluation purposes only; please review "About This Evaluation Edition" in the *Cloud Deployment Model Cookbook for AKS (Evaluation Edition)* for more information. Information about large clusters with 100,000,000 users is now available for GKE and EKS. You can find cluster creation example commands here: • "Creating the Cluster" in the *Cloud Deployment Model Cookbook for GKE* • "Creating a Kubernetes Cluster" in the *Cloud Deployment Model Cookbook for Amazon EKS* Benchmarking results are available here: • "*Benchmarking the CDM Performance*" in the *Cloud Deployment Model Cookbook for GKE* • "*Benchmarking the CDM Performance*" in the *Cloud Deployment Model Cookbook for Amazon EKS* Updated the DevOps Release Notes to mention the availability of artifacts for deploying the CDM on RedHat OpenShift running on Amazon Web Services in the `forgeops` repository. Corrected the steps for benchmarking IG. See "Identity Gateway Benchmark Tests" in the *Cloud Deployment Model Cookbook for GKE* and "Identity Gateway Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Added the `--subnetwork` argument to the **gcloud container clusters create** command in "Creating the Cluster" in the *Cloud Deployment Model Cookbook for GKE*.
2019-01-29	Installing the latest version of the `cert-manager` Helm chart is no longer recommended. Instead, install the version specified in the example commands for installing the certificate manager. See "Installing the Certificate Manager" in the *DevOps Developer's Guide*, "Deploying the Certificate Manager" in the *Cloud Deployment Model Cookbook for GKE*, and "Deploying the Certificate Manager" in the *Cloud Deployment Model Cookbook for Amazon EKS*.
2019-01-28	Added a new section, "An Overview of CDM in Amazon EKS" in the *Cloud Deployment Model Cookbook for Amazon EKS*. This overview contains a diagram illustrating the Amazon AWS components you must create when deploying ForgeRock Identity Platform on Amazon EKS. Revised the "*Getting Support*" appendix. This important revision contains changes to ForgeRock's support commitments for the DevOps Examples and the CDM. ForgeRock now offers commercial support for Dockerfiles and Helm charts in the `forgeops` repository. Corrected "Creating a Virtual Private Cloud" in the *Cloud Deployment Model Cookbook for Amazon EKS* and "Creating an Amazon EFS File System" in the *Cloud Deployment Model Cookbook for Amazon EKS* to use two subnets (availability zones) instead of three.

Date	Description
	Added a new section, "Creating a Key Pair to Connect to Worker Nodes" in the *Cloud Deployment Model Cookbook for Amazon EKS*. This section provides instructions on how to create a key pair that is required for connecting to Amazon EC2 instances. Corrected the procedures in "Creating and Setting Up a Kubernetes Cluster" in the *Cloud Deployment Model Cookbook for Amazon EKS* so that users set the Kubernetes context before creating worker nodes. Added steps to create a routing record for Gatling in "Deploying an Ingress Controller" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Updated the Amazon EKS benchmarking results tables with small cluster (1,000,000 users) benchmark results for DS, AM, and IDM on Amazon EKS. See "Running Directory Services Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS*, "Access Management Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS* and "Identity Management Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS*.
2019-01-03	Added the Cloud Deployment Model Cookbook for Amazon EKS and the Site Reliability Guide for Amazon EKS to "*What's New*". Corrected the procedure for setting up the userstores for benchmarking the CDM. In the updated procedure, you: • Invoke the **scripts/backup.sh** command instead of the default DS **backup** command. • Set the generation ID in the `userstore-1` server, so that replication works correctly. • Prime the `userstore-0` and `userstore-1` servers. See the following sections for the updated procedures: • "Before You Begin" in the *Cloud Deployment Model Cookbook for GKE* • "Before You Begin" in the *Cloud Deployment Model Cookbook for Amazon EKS*
2018-12-21	Updated the Amazon EKS benchmarking results tables with new information: • New benchmark results for DS, AM, and IG on Amazon EKS. See "Access Management Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS* and "Identity Gateway Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS*. • Updates to the cost estimates for the Amazon EKS benchmark. See "Cost Estimates for Running CDM on Amazon Web Services" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Added language to improve key and certificate handling safety: • In "To Configure the Configuration Repository Private Key" in the *DevOps Developer's Guide*, mentioned that private key files copied into the `forgeops` repository clone are present only temporarily, and warned users not to perform **git add** or **git commit** commands when private key files are temporarily present in the clone.

Date	Description
	• In "To Secure Communication Using a Trust Chain" in the *DevOps Developer's Guide*, mentioned that signing certificate files copied into the `forgeops` repository clone are present only temporarily, and warned users not to perform **git add** or **git commit** commands when signing certificate files are temporarily present in the clone. • In "To Install the frconfig Helm Chart" in the *DevOps Developer's Guide*, added steps to remove private key and signing certificate files that had been temporarily copied into the `forgeops` repository clone. Revised "Automating Certificate Management" in the *Site Reliability Guide for Amazon EKS*, which incorrectly stated that CDM certificate management on Amazon EKS is configured to call Let's Encrypt to dynamically generate an SSL certificate. The text now correctly states that the CDM, when deployed on Amazon EKS, uses a self-signed certificate to secure communications. Added a release note to "*Changes and Deprecated Functionality*" about the changed structure of the `forgeops-init` repository. Changed "Creating Storage Classes" in the *Cloud Deployment Model Cookbook for Amazon EKS* to use `gp2` storage instead of `io1` storage. Corrected the quotes around the `--resources-vpc-config` option of the example **aws eks create-cluster** command. This example command appears in "Creating a Kubernetes Cluster" in the *Cloud Deployment Model Cookbook for Amazon EKS*. Added steps to configure AM for stateful sessions, stateless sessions, stateful OAuth 2.0 tokens, and stateless OAuth2.0 tokens in the following sections: • "Access Management Benchmark Tests" in the *Cloud Deployment Model Cookbook for GKE* • "Access Management Benchmark Tests" in the *Cloud Deployment Model Cookbook for Amazon EKS* Corrected values to enter for the `testname` key of the `/path/to/forgeops/helm/gatling-benchmark/values.yaml` file in the following chapters: • "*Benchmarking the CDM Performance*" in the *Cloud Deployment Model Cookbook for GKE* • "*Benchmarking the CDM Performance*" in the *Cloud Deployment Model Cookbook for Amazon EKS* Added `web` Helm chart installation as part of CDM deployment. See: • "To Deploy the web Application" in the *Cloud Deployment Model Cookbook for GKE* • "To Deploy the web Application" in the *Cloud Deployment Model Cookbook for Amazon EKS*
2018-12-14	Updated and moved the architecture diagrams in the following sections: • "CDM Overview" in the *Cloud Deployment Model Cookbook for GKE*.

Date	Description
	• "CDM Overview" in the *Cloud Deployment Model Cookbook for Amazon EKS* Corrected the steps and terminal window output in the following procedures: • "To Scale the Deployment" in the *Cloud Deployment Model Cookbook for GKE*. • "To Scale the Deployment" in the *Cloud Deployment Model Cookbook for Amazon EKS* Mentioned in "*Changes and Deprecated Functionality*" that the `forgerock-charts` Helm repository is no longer available, and that users should now access Helm charts from their `forgeops` repository clones. Mentioned in "*Changes and Deprecated Functionality*" that the IG example now runs in production mode; therefore, IG cannot be accessed after you deploy the example. Corrected "Secure Communication With ForgeRock Identity Platform Services" in the *DevOps Quick Start Guide*, which incorrectly stated that the DevOps Examples use insecure communication over HTTP. The section now states that they use secure communication over HTTPS. Changed the term *Google Filestore* to use Google's new branding, *Cloud Filestore*. Removed all text that stated that backups are scheduled as part of CDM deployment. CDM benchmarks were run on deployments in which DS backups were not scheduled. In "frconfig.yaml" in the *DevOps Developer's Guide*, changed the default value in the `frconfig.yaml` file example from `release/6.5.0` to `my-branch`. In version 6.5, the `forgeops-init` repository maintains ForgeRock Identity Platform configurations in directories rather than branches. For more information, see the `forgeops-init` repository README file.
2018-11-30	Released version 6.5 of the DevOps Examples and the CDM.

Appendix A. Getting Support

This appendix contains information about support options for the ForgeRock DevOps Examples and the ForgeRock Identity Platform.

A.1. ForgeRock DevOps Support

ForgeRock has developed artifacts in the `forgeops` and `forgeops-init` Git repositories for the purpose of deploying the ForgeRock Identity Platform in the cloud. The companion ForgeRock DevOps documentation provides examples, including the ForgeRock Cloud Deployment Model (CDM), to help you get started.

These artifacts and documentation are provided on an "as is" basis. ForgeRock does not guarantee the individual success developers may have in implementing the code on their development platforms or in production configurations.

A.1.1. Commercial Support

ForgeRock provides commercial support for the following DevOps resources:

- Dockerfiles and Helm charts in the `forgeops` Git repository
- ForgeRock DevOps guides.

ForgeRock provides commercial support for the ForgeRock Identity Platform. For supported components, containers, and Java versions, see the following:

- *ForgeRock Access Management Release Notes*
- *ForgeRock Identity Management Release Notes*

- *ForgeRock Directory Services Release Notes*
- *ForgeRock Identity Message Broker Release Notes*
- *ForgeRock Identity Gateway Release Notes*

A.1.2. Support Limitations

ForgeRock provides no commercial support for the following:

- Artifacts other than Dockerfiles or Helm charts in the `forgeops` and `forgeops-init` repositories. Examples include scripts, example configurations, and so forth.
- Non-ForgeRock infrastructure. Examples include Docker, Kubernetes, Google Cloud Platform, Amazon Web Services, and so forth.
- Non-ForgeRock software. Examples include Java, Apache Tomcat, NGINX, Apache HTTP Server, and so forth.
- Production deployments that use the DevOps evaluation-only Docker images. When deploying the ForgeRock Identity Platform using Docker images, you must build and use your own images for production deployments. For information about how to build Docker images for the ForgeRock Identity Platform, see "*Building and Pushing Docker Images*" in the *DevOps Developer's Guide*.

A.1.3. Third-Party Kubernetes Services

ForgeRock supports deployments on Google Kubernetes Engine (GKE), Amazon Elastic Kubernetes Service (Amazon EKS), Microsoft Azure Kubernetes Service (AKS), and Red Hat OpenShift.

Red Hat OpenShift is a tested and supported platform using Kubernetes for deployment. ForgeRock uses OpenShift tools such as Minishift, as well as other representative environments such as Amazon AWS for the testing. We do not test using bare metal due to the many customer permutations of deployment and configuration that may exist, and therefore cannot guarantee that we have tested in the same way a customer chooses to deploy. We will make commercially reasonable efforts to provide first-line support for any reported issue. In the case we are unable to reproduce a reported issue internally, we will request the customer engage OpenShift support to collaborate on problem identification and remediation. Customers deploying on OpenShift are expected to have a support contract in place with IBM/Red Hat that ensures support resources can be engaged if this situation may occur.

A.2. Accessing Documentation Online

ForgeRock publishes comprehensive documentation online:

- The ForgeRock Knowledge Base offers a large and increasing number of up-to-date, practical articles that help you deploy and manage ForgeRock software.

While many articles are visible to community members, ForgeRock customers have access to much more, including advanced information for customers using ForgeRock software in a mission-critical capacity.

- ForgeRock product documentation, such as this document, aims to be technically accurate and complete with respect to the software documented. It is visible to everyone and covers all product features and examples of how to use them.

A.3. How to Report Problems or Provide Feedback

If you are a named customer Support Contact, contact ForgeRock using the Customer Support Portal to request information or report a problem with Dockerfiles or Helm charts in the DevOps Examples or the CDM.

If you have questions regarding the DevOps Examples or the CDM that are not answered in the documentation, file an issue at https://github.com/ForgeRock/forgeops/issues.

When requesting help with a problem, include the following information:

- Description of the problem, including when the problem occurs and its impact on your operation.
- Steps to reproduce the problem.

  If the problem occurs on a Kubernetes system other than Minikube, GKE, EKS, OpenShift, or AKS, we might ask you to reproduce the problem on one of those.
- HTML output from the **debug-logs.sh** script. For more information, see "Running the debug-logs.sh Script" in the *DevOps Developer's Guide*.
- Description of the environment, including the following information:
  - Environment type: Minikube, GKE, EKS, AKS, or OpenShift.
  - Software versions of supporting components:
    - Oracle VirtualBox (Minikube environments only).
    - Docker client (all environments).
    - Minikube (all environments).
    - **kubectl** command (all environments).
    - Kubernetes Helm (all environments).
    - Google Cloud SDK (GKE environments only).
    - Amazon AWS Command Line Interface (EKS environments only).

- Azure Command Line Interface (AKS environments only).

- `forgeops` repository branch.
- Any patches or other software that might be affecting the problem.

A.4. Getting Support and Contacting ForgeRock

ForgeRock provides support services, professional services, training through ForgeRock University, and partner services to assist you in setting up and maintaining your deployments. For a general overview of these services, see https://www.forgerock.com.

ForgeRock has staff members around the globe who support our international customers and partners. For details on ForgeRock's support offering, including support plans and service level agreements (SLAs), visit https://www.forgerock.com/support.