



Red Hat Process Automation Manager 7.8

Deploying a Red Hat Process Automation
Manager freeform managed server
environment on Red Hat OpenShift Container
Platform

Red Hat Process Automation Manager 7.8 Deploying a Red Hat Process Automation Manager freeform managed server environment on Red Hat OpenShift Container Platform

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Abstract

This document describes how to deploy a Red Hat Process Automation Manager 7.8 freeform managed server environment on Red Hat OpenShift Container Platform.

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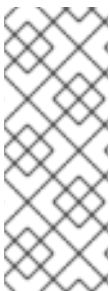
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PREFACE

As a system engineer, you can deploy a Red Hat Process Automation Manager freeform managed server environment on Red Hat OpenShift Container Platform to provide an infrastructure to execute services, process applications, and other business assets. You can deploy any number of managed KIE Servers and control them using the same Business Central Monitoring. You can add and remove the KIE Servers as necessary; Business Central Monitoring establishes a connection to them automatically. You can also use the same Business Central Monitoring instance to monitor immutable KIE Servers.

Prerequisites

- Red Hat OpenShift Container Platform version 3.11 is deployed.
- At least four gigabytes of memory are available in the OpenShift cluster/namespace.
- The OpenShift project for the deployment is created.
- You are logged in to the project using the **oc** command. For more information about the **oc** command-line tool, see the [OpenShift Container Platform CLI Reference](#). If you want to use the OpenShift Web console to deploy templates, you must also be logged on using the Web console.
- Dynamic persistent volume (PV) provisioning is enabled. Alternatively, if dynamic PV provisioning is not enabled, enough persistent volumes must be available. By default, the deployed components require the following PV sizes:
 - Business Central Monitoring requires a 64Mi PV.
 - Each KIE Server deployment by default requires one 1Gi PV for the database. You can change the database PV size in the template parameters. If you deploy multiple separate KIE Servers, each of the servers requires a separate database PV. This requirement does not apply if you use an external database server.
- Your OpenShift environment supports persistent volumes with **ReadWriteMany** mode. If your environment does not support this mode, you can use NFS to provision the volumes. For information about access mode support in OpenShift public and dedicated clouds, see [Access Modes](#).



NOTE

Since Red Hat Process Automation Manager version 7.5, images and templates for Red Hat OpenShift Container Platform 3.x are deprecated. These images and templates do not get new features, but remain supported until the end of full support for Red Hat OpenShift Container Platform version 3.x. For more information about the full support lifecycle phase for Red Hat OpenShift Container Platform version 3.x, see [Red Hat OpenShift Container Platform Life Cycle Policy \(non-current versions\)](#).



NOTE

Do not use Red Hat Process Automation Manager templates with Red Hat OpenShift Container Platform 4.x. To deploy Red Hat Process Automation Manager on Red Hat OpenShift Container Platform 4.x, see the instructions in [Deploying a Red Hat Process Automation Manager environment on Red Hat OpenShift Container Platform using Operators](#).

CHAPTER 1. OVERVIEW OF RED HAT PROCESS AUTOMATION MANAGER ON RED HAT OPENSIFT CONTAINER PLATFORM

You can deploy Red Hat Process Automation Manager into a Red Hat OpenShift Container Platform environment.

In this solution, components of Red Hat Process Automation Manager are deployed as separate OpenShift pods. You can scale each of the pods up and down individually to provide as few or as many containers as required for a particular component. You can use standard OpenShift methods to manage the pods and balance the load.

The following key components of Red Hat Process Automation Manager are available on OpenShift:

- KIE Server, also known as *Execution Server*, is the infrastructure element that runs decision services, process applications, and other deployable assets (collectively referred to as *services*) . All logic of the services runs on execution servers.

A database server is normally required for KIE Server. You can provide a database server in another OpenShift pod or configure an execution server on OpenShift to use any other database server. Alternatively, KIE Server can use an H2 database; in this case, you cannot scale the pod.

In some templates, you can scale up a KIE Server pod to provide as many copies as required, running on the same host or different hosts. As you scale a pod up or down, all of its copies use the same database server and run the same services. OpenShift provides load balancing and a request can be handled by any of the pods.

You can deploy a separate KIE Server pod to run a different group of services. That pod can also be scaled up or down. You can have as many separate replicated KIE Server pods as required.

- Business Central is a web-based interactive environment used for authoring services. It also provides a management and monitoring console. You can use Business Central to develop services and deploy them to KIE Servers. You can also use Business Central to monitor the execution of processes.

Business Central is a centralized application. However, you can configure it for high availability, where multiple pods run and share the same data.

Business Central includes a Git repository that holds the source for the services that you develop on it. It also includes a built-in Maven repository. Depending on configuration, Business Central can place the compiled services (KJAR files) into the built-in Maven repository or (if configured) into an external Maven repository.

- Business Central Monitoring is a web-based management and monitoring console. It can manage the deployment of services to KIE Servers and provide monitoring information, but does not include authoring capabilities. You can use this component to manage staging and production environments.
- Smart Router is an optional layer between KIE Servers and other components that interact with them. When your environment includes many services running on different KIE Servers, Smart Router provides a single endpoint to all client applications. A client application can make a REST API call that requires any service. Smart Router automatically calls the KIE Server that can process a particular request.

You can arrange these and other components into various environment configurations within OpenShift.

The following environment types are typical:

- *Authoring*: An environment for creating and modifying services using Business Central. It consists of pods that provide Business Central for the authoring work and a KIE Server for test execution of the services. For instructions about deploying this environment, see [Deploying a Red Hat Process Automation Manager authoring environment on Red Hat OpenShift Container Platform](#).
- *Managed deployment*: An environment for running existing services for staging and production purposes. This environment includes several groups of KIE Server pods; you can deploy and undeploy services on every such group and also scale the group up or down as necessary. Use Business Central Monitoring to deploy, run, and stop the services and to monitor their execution. You can deploy two types of managed environment. In a *freeform* server environment, you initially deploy Business Central Monitoring and one KIE Server. You can additionally deploy any number of KIE Servers. Business Central Monitoring can connect to all servers in the same namespace. For instructions about deploying this environment, see [Deploying a Red Hat Process Automation Manager freeform managed server environment on Red Hat OpenShift Container Platform](#).

Alternatively, you can deploy a *fixed* managed server environment. A single deployment includes Business Central Monitoring, Smart Router, and a preset number of KIE Servers (by default, two servers, but you can modify the template to change the number). You cannot easily add or remove servers at a later time. For instructions about deploying this environment, see [Deploying a Red Hat Process Automation Manager fixed managed server environment on Red Hat OpenShift Container Platform](#).

- *Deployment with immutable servers*: An alternate environment for running existing services for staging and production purposes. In this environment, when you deploy a KIE Server pod, it builds an image that loads and starts a service or group of services. You cannot stop any service on the pod or add any new service to the pod. If you want to use another version of a service or modify the configuration in any other way, you deploy a new server image and displace the old one. In this system, the KIE Server runs like any other pod on the OpenShift environment; you can use any container-based integration workflows and do not need to use any other tools to manage the pods. Optionally, you can use Business Central Monitoring to monitor the performance of the environment and to stop and restart some of the service instances, but not to deploy additional services to any KIE Server or undeploy any existing ones (you cannot add or remove containers). For instructions about deploying this environment, see [Deploying a Red Hat Process Automation Manager immutable server environment on Red Hat OpenShift Container Platform](#).

You can also deploy a *trial* or evaluation environment. This environment includes Business Central and a KIE Server. You can set it up quickly and use it to evaluate or demonstrate developing and running assets. However, the environment does not use any persistent storage, and any work you do in the environment is not saved. For instructions about deploying this environment, see [Deploying a Red Hat Process Automation Manager trial environment on Red Hat OpenShift Container Platform](#).

To deploy a Red Hat Process Automation Manager environment on OpenShift, you can use the templates that are provided with Red Hat Process Automation Manager. You can modify the templates to ensure that the configuration suits your environment.

CHAPTER 2. PREPARING TO DEPLOY RED HAT PROCESS AUTOMATION MANAGER IN YOUR OPENSIFT ENVIRONMENT

Before deploying Red Hat Process Automation Manager in your OpenShift environment, you must complete several tasks. You do not need to repeat these tasks if you want to deploy additional images, for example, for new versions of processes or for other processes.

2.1. ENSURING THE AVAILABILITY OF IMAGE STREAMS AND THE IMAGE REGISTRY

To deploy Red Hat Process Automation Manager components on Red Hat OpenShift Container Platform, you must ensure that OpenShift can download the correct images from the Red Hat registry. To download the images, OpenShift requires *image streams*, which contain the information about the location of images. OpenShift also must be configured to authenticate with the Red Hat registry using your service account user name and password.

Some versions of the OpenShift environment include the required image streams. You must check if they are available. If image streams are available in OpenShift by default, you can use them if the OpenShift infrastructure is configured for registry authentication server. The administrator must complete the registry authentication configuration when installing the OpenShift environment.

Otherwise, you can configure registry authentication in your own project and install the image streams in that project.

Procedure

1. Determine whether Red Hat OpenShift Container Platform is configured with the user name and password for Red Hat registry access. For details about the required configuration, see [Configuring a Registry Location](#). If you are using an OpenShift Online subscription, it is configured for Red Hat registry access.
2. If Red Hat OpenShift Container Platform is configured with the user name and password for Red Hat registry access, enter the following commands:

```
$ oc get imagestreamtag -n openshift | grep -F rhpam-businesscentral | grep -F 7.8
$ oc get imagestreamtag -n openshift | grep -F rhpam-kieserver | grep -F 7.8
```

If the outputs of both commands are not empty, the required image streams are available in the **openshift** namespace and no further action is required.

3. If the output of one or both of the commands is empty or if OpenShift is not configured with the user name and password for Red Hat registry access, complete the following steps:
 - a. Ensure you are logged in to OpenShift with the **oc** command and that your project is active.
 - b. Complete the steps documented in [Registry Service Accounts for Shared Environments](#). You must log in to the Red Hat Customer Portal to access the document and to complete the steps to create a registry service account.
 - c. Select the **OpenShift Secret** tab and click the link under **Download secret** to download the YAML secret file.
 - d. View the downloaded file and note the name that is listed in the **name:** entry.

- e. Enter the following commands:

```
oc create -f <file_name>.yaml
oc secrets link default <secret_name> --for=pull
oc secrets link builder <secret_name> --for=pull
```

Replace **<file_name>** with the name of the downloaded file and **<secret_name>** with the name that is listed in the **name:** entry of the file.

- f. Download the **rhcam-7.8.0-openshift-templates.zip** product deliverable file from the [Software Downloads](#) page and extract the **rhcam78-image-streams.yaml** file.
- g. Enter the following command:

```
$ oc apply -f rhcam78-image-streams.yaml
```



NOTE

If you complete these steps, you install the image streams into the namespace of your project. In this case, when you deploy the templates, you must set the **IMAGE_STREAM_NAMESPACE** parameter to the name of this project.

2.2. CREATING THE SECRETS FOR KIE SERVER

OpenShift uses objects called *secrets* to hold sensitive information such as passwords or keystores. For more information about OpenShift secrets, see the [Secrets chapter](#) in the Red Hat OpenShift Container Platform documentation.

You must create an SSL certificate for HTTP access to KIE Server and provide it to your OpenShift environment as a secret.

Procedure

1. Generate an SSL keystore with a private and public key for SSL encryption for KIE Server. For more information on how to create a keystore with self-signed or purchased SSL certificates, see [Generate a SSL Encryption Key and Certificate](#).



NOTE

In a production environment, generate a valid signed certificate that matches the expected URL for KIE Server.

2. Save the keystore in a file named **keystore.jks**.
3. Record the name of the certificate. The default value for this name in Red Hat Process Automation Manager configuration is **jboss**.
4. Record the password of the keystore file. The default value for this name in Red Hat Process Automation Manager configuration is **mykeystorepass**.
5. Use the **oc** command to generate a secret named **kieserver-app-secret** from the new keystore file:

```
$ oc create secret generic kieserver-app-secret --from-file=keystore.jks
```

2.3. CREATING THE SECRETS FOR BUSINESS CENTRAL

You must create an SSL certificate for HTTP access to Business Central and provide it to your OpenShift environment as a secret.

Do not use the same certificate and keystore for Business Central and KIE Server.

Procedure

1. Generate an SSL keystore with a private and public key for SSL encryption for Business Central. For more information on how to create a keystore with self-signed or purchased SSL certificates, see [Generate a SSL Encryption Key and Certificate](#).



NOTE

In a production environment, generate a valid signed certificate that matches the expected URL for Business Central.

2. Save the keystore in a file named **keystore.jks**.
3. Record the name of the certificate. The default value for this name in Red Hat Process Automation Manager configuration is **jboss**.
4. Record the password of the keystore file. The default value for this name in Red Hat Process Automation Manager configuration is **mykeystorepass**.
5. Use the **oc** command to generate a secret named **businesscentral-app-secret** from the new keystore file:

```
$ oc create secret generic businesscentral-app-secret --from-file=keystore.jks
```

2.4. CREATING THE SECRET FOR THE ADMINISTRATIVE USER

You must create a generic secret that contains the user name and password for a Red Hat Process Automation Manager administrative user account. This secret is required for deploying Red Hat Process Automation Manager using any template except the trial template.

The secret must contain the user name and password as literals. The key name for the user name is **KIE_ADMIN_USER**. The key name for the password is **KIE_ADMIN_PWD**.

If you are using multiple templates to deploy components of Red Hat Process Automation Manager, use the same secret for all these deployments. The components utilize this user account to communicate with each other.

You can also use this user account to log in to Business Central Monitoring.



IMPORTANT

If you use RH-SSO or LDAP authentication, the same user with the same password must be configured in your authentication system with the **kie-server,rest-all,admin** roles for Red Hat Process Automation Manager.

Procedure

Use the **oc** command to generate a generic secret named **kie-admin-user-secret** from the user name and password:

```
$ oc create secret generic rhpam-credentials --from-literal=KIE_ADMIN_USER=adminUser --from-literal=KIE_ADMIN_PWD=adminPassword
```

In this command, replace *adminPassword* with the password for the administrative user. Optionally, you can replace *adminUser* with another user name for the administrative user.

2.5. BUILDING A CUSTOM KIE SERVER EXTENSION IMAGE FOR AN EXTERNAL DATABASE

If you want to use an external database server for a KIE Server and the database server is not a MySQL or PostgreSQL server, you must build a custom KIE Server extension image with drivers for this server before deploying your environment.

Complete the steps in this build procedure to provide drivers for any of the following database servers:

- Microsoft SQL Server
- IBM DB2
- Oracle Database
- Sybase

Optionally, you can use this procedure to build a new version of drivers for any of the following database servers:

- MySQL
- MariaDB
- PostgreSQL

For the supported versions of the database servers, see [Red Hat Process Automation Manager 7 Supported Configurations](#).

The build procedure creates a custom extension image that extends the existing KIE Server image. You must import this custom extension image into your OpenShift environment and then reference it in the **EXTENSIONS_IMAGE** parameter.

Prerequisites

- You are logged in to your OpenShift environment using the **oc** command. Your OpenShift user must have the **registry-editor** role.
- For Oracle Database, IBM DB2, or Sybase, you downloaded the JDBC driver from the database server vendor.
- You have installed the following required software:
 - Docker: For installation instructions, see [Get Docker](#).

- Cekit version 3.2: For installation instructions, see [Installation](#).
- The following libraries and extensions for Cekit. For more information, see [Dependencies](#).
 - **docker**, provided by the **python3-docker** package or similar package
 - **docker-squash**, provided by the **python3-docker-squash** package or similar package
 - **behave**, provided by the **python3-behave** package or similar package

Procedure

1. For IBM DB2, Oracle Database, or Sybase, provide the JDBC driver JAR file in a local directory.
2. Download the **rhcam-7.8.0-openshift-templates.zip** product deliverable file from the [Software Downloads](#) page of the Red Hat Customer Portal.
3. Unzip the file and, using the command line, change to the **templates/contrib/jdbc/cekit** directory of the unzipped file. This directory contains the source code for the custom build.
4. Enter one of the following commands, depending on the database server type:

- For Microsoft SQL Server:

```
make mssql
```

- For MySQL:

```
make mysql
```

- For PostgreSQL:

```
make postgresql
```

- For MariaDB:

```
make mariadb
```

- For IBM DB2:

```
make db2 artifact=/tmp/db2jcc4.jar version=10.2
```

In this command, replace **/tmp/db2jcc4.jar** with the path name of the IBM DB2 driver and **10.2** with the version of the driver.

- For Oracle Database:

```
make oracle artifact=/tmp/ojdbc7.jar version=7.0
```

In this command, replace **/tmp/ojdbc7.jar** with the path name of the Oracle Database driver and **7.0** with the version of the driver.

- For Sybase:

```
make build sybase artifact=/tmp/jconn4-16.0_PL05.jar version=16.0_PL05
```

In this command, replace `/tmp/jconn4-16.0_PL05.jar` with the path name of the downloaded Sybase driver and `16.0_PL05` with the version of the driver.

Alternatively, if you need to update the driver class or driver XA class for the Sybase driver, you can set the `DRIVER_CLASS` or `DRIVER_XA_CLASS` variable for this command, for example:

```
export DRIVER_CLASS=another.class.Sybase && make sybase artifact=/tmp/jconn4-16.0_PL05.jar version=16.0_PL05
```

5. Enter the following command to list the Docker images that are available locally:

```
docker images
```

Note the name of the image that was built, for example, `jboss-kie-db2-extension-openshift-image`, and the version tag of the image, for example, `11.1.4.4` (not the `latest` tag).

6. Access the registry of your OpenShift environment directly and push the image to the registry. Depending on your user permissions, you can push the image into the `openshift` namespace or into a project namespace. For instructions about accessing the registry and pushing the images, see [Accessing the Registry Directly](#) in the Red Hat OpenShift Container Platform product documentation.
7. When configuring your KIE Server deployment with a template that supports an external database server, set the following parameters:
 - **Drivers Extension Image (`EXTENSIONS_IMAGE`):** The ImageStreamTag definition of the extension image, for example, `jboss-kie-db2-extension-openshift-image:11.1.4.4`
 - **Drivers ImageStream Namespace (`EXTENSIONS_IMAGE_NAMESPACE`):** The namespace to which you uploaded the extension image, for example, `openshift` or your project namespace.

2.6. PROVISIONING PERSISTENT VOLUMES WITH READWRITEMANY ACCESS MODE USING NFS

If you want to deploy Business Central Monitoring, your environment must provision persistent volumes with **ReadWriteMany** access mode.

If your configuration requires provisioning persistent volumes with **ReadWriteMany** access mode but your environment does not support such provisioning, use NFS to provision the volumes. Otherwise, skip this procedure.

Procedure

Deploy an NFS server and provision the persistent volumes using NFS. For information about provisioning persistent volumes using NFS, see the "Persistent storage using NFS" section of the [Configuring Clusters](#) guide in the Red Hat OpenShift Container Platform 3.11 documentation.

2.7. PREPARING A MAVEN MIRROR REPOSITORY FOR OFFLINE USE

If your Red Hat OpenShift Container Platform environment does not have outgoing access to the public Internet, you must prepare a Maven repository with a mirror of all the necessary artifacts and make this repository available to your environment.



NOTE

You do not need to complete this procedure if your Red Hat OpenShift Container Platform environment is connected to the Internet.

Prerequisites

- A computer that has outgoing access to the public Internet is available.

Procedure

1. Configure a Maven release repository to which you have write access. The repository must allow read access without authentication and your OpenShift environment must have network access to this repository.

You can deploy a Nexus repository manager in the OpenShift environment. For instructions about setting up Nexus on OpenShift, see [Setting up Nexus](#) in the Red Hat OpenShift Container Platform 3.11 documentation. Use this repository as a separate mirror repository.

Alternatively, if you use a custom external repository (for example, Nexus) for your services, you can use the same repository as a mirror repository.

2. On the computer that has an outgoing connection to the public Internet, complete the following steps:
 - a. Click **Red Hat Process Automation Manager 7.8.0 Offliner Content List** to download the **rhpm-7.8.0-offliner.zip** product deliverable file from the [Software Downloads](#) page of the Red Hat Customer Portal.
 - b. Extract the contents of the **rhpm-7.8.0-offliner.zip** file into any directory.
 - c. Change to the directory and enter the following command:

```
./offline-repo-builder.sh offliner.txt
```

This command creates a **repository** subdirectory and downloads the necessary artifacts into this subdirectory.

If a message reports that some downloads have failed, run the same command again. If downloads fail again, contact Red Hat support.

- d. Upload all artifacts from the **repository** subdirectory to the Maven mirror repository that you prepared. You can use the Maven Repository Provisioner utility, available from the [Maven repository tools](#) Git repository, to upload the artifacts.
3. If you developed services outside Business Central and they have additional dependencies, add the dependencies to the mirror repository. If you developed the services as Maven projects, you can use the following steps to prepare these dependencies automatically. Complete the steps on the computer that has an outgoing connection to the public Internet.
 - a. Create a backup of the local Maven cache directory (`~/.m2/repository`) and then clear the directory.

- b. Build the source of your projects using the **mvn clean install** command.
- c. For every project, enter the following command to ensure that Maven downloads all runtime dependencies for all the artifacts generated by the project:

```
mvn -e -DskipTests dependency:go-offline -f /path/to/project/pom.xml --batch-mode -Djava.net.preferIPv4Stack=true
```

Replace **/path/to/project/pom.xml** with the correct path to the **pom.xml** file of the project.

- d. Upload all artifacts from the local Maven cache directory (**~/.m2/repository**) to the Maven mirror repository that you prepared. You can use the Maven Repository Provisioner utility, available from the [Maven repository tools](#) Git repository, to upload the artifacts.

CHAPTER 3. FREEFORM MANAGED SERVER ENVIRONMENT

You can deploy a freeform server environment that includes several different pods running KIE Server. These KIE Servers can run different services for staging or production purposes. You can add and remove servers as necessary at any time.

You start deploying a freeform managed server environment by deploying Business Central Monitoring and one managed KIE Server. You can use Business Central Monitoring to monitor and, when necessary, manage the execution of services on KIE Servers. This environment does not include Smart Router.

You can also deploy additional managed KIE Servers. Each KIE Server can be separately scaled as necessary.

On a managed KIE Server, no services are initially loaded. Use Business Central Monitoring or the REST API of the KIE Server to deploy and undeploy processes on the server.

You must provide a Maven repository with the processes (KJAR files) that you want to deploy on the servers. Your integration process must ensure that the required versions of the processes are uploaded to the Maven repository. You can use Business Central in a development environment to create the processes and upload them to the Maven repository.

Each KIE Server uses a database server. Usually, the database servers also run in pods, although you can set up a KIE Server to use an external database server.

You can also deploy immutable KIE Servers in the same namespace. You can use Business Central Monitoring to view monitoring information for all KIE Servers in the environment, including immutable servers. For instructions about deploying immutable KIE Servers, see [Deploying a Red Hat Process Automation Manager immutable server environment on Red Hat OpenShift Container Platform](#).

3.1. DEPLOYING MONITORING AND A SINGLE KIE SERVER FOR A FREEFORM ENVIRONMENT

To start deploying a freeform environment, deploy Business Central Monitoring and a single managed KIE Server, which uses a PostgreSQL database server in a pod. No services are loaded on the KIE Server. Use Business Central Monitoring to deploy and undeploy services on the server.

You can then add more KIE Servers as necessary.

3.1.1. Starting configuration of the template for monitoring and a single KIE Server

To deploy Business Central Monitoring and a single managed KIE Server, use the **rhpm78-managed.yaml** template file.

Procedure

1. Download the **rhpm-7.8.0-openshift-templates.zip** product deliverable file from the [Software Downloads](#) page of the Red Hat Customer Portal.
2. Extract the **rhpm78-managed.yaml** template file.
3. Use one of the following methods to start deploying the template:
 - To use the OpenShift Web UI, in the OpenShift application console select **Add to Project** → **Import YAML / JSON** and then select or paste the **rhpm78-managed.yaml** file. In the **Add Template** window, ensure **Process the template** is selected and click **Continue**.

- To use the OpenShift command line console, prepare the following command line:

```
oc new-app -f <template-path>/rhpam78-managed.yaml -p
BUSINESS_CENTRAL_HTTPS_SECRET=businesscentral-app-secret -p
KIE_SERVER_HTTPS_SECRET=kieserver-app-secret -p PARAMETER=value
```

In this command line, make the following changes:

- Replace **<template-path>** with the path to the downloaded template file.
- Use as many **-p PARAMETER=value** pairs as needed to set the required parameters.

Next steps

Set the parameters for the template. Follow the steps in [Section 3.1.2, "Setting required parameters for monitoring and a single KIE Server"](#) to set common parameters. You can view the template file to see descriptions for all parameters.

3.1.2. Setting required parameters for monitoring and a single KIE Server

When configuring the template to deploy Business Central Monitoring and a single managed KIE Server, you must set the following parameters in all cases.

Prerequisites

- You started the configuration of the template, as described in [Section 3.1.1, "Starting configuration of the template for monitoring and a single KIE Server"](#).

Procedure

1. Set the following parameters:

- **Credentials secret (CREDENTIALS_SECRET)**: The name of the secret containing the administrative user credentials, as created in [Section 2.4, "Creating the secret for the administrative user"](#).
- **Business Central Monitoring Server Keystore Secret Name (BUSINESS_CENTRAL_HTTPS_SECRET)**: The name of the secret for Business Central, as created in [Section 2.3, "Creating the secrets for Business Central"](#).
- **KIE Server Keystore Secret Name (KIE_SERVER_HTTPS_SECRET)**: The name of the secret for KIE Server, as created in [Section 2.2, "Creating the secrets for KIE Server"](#).
- **Business Central Monitoring Server Certificate Name (BUSINESS_CENTRAL_HTTPS_NAME)**: The name of the certificate in the keystore that you created in [Section 2.3, "Creating the secrets for Business Central"](#).
- **Business Central Monitoring Server Keystore Password (BUSINESS_CENTRAL_HTTPS_PASSWORD)**: The password for the keystore that you created in [Section 2.3, "Creating the secrets for Business Central"](#).
- **KIE Server Certificate Name (KIE_SERVER_HTTPS_NAME)**: The name of the certificate in the keystore that you created in [Section 2.2, "Creating the secrets for KIE Server"](#).
- **KIE Server Keystore Password (KIE_SERVER_HTTPS_PASSWORD)**: The password for the keystore that you created in [Section 2.2, "Creating the secrets for KIE Server"](#).

- **Application Name (APPLICATION_NAME)**: The name of the OpenShift application. It is used in the default URLs for Business Central Monitoring and KIE Server. OpenShift uses the application name to create a separate set of deployment configurations, services, routes, labels, and artifacts.
- **Enable KIE server global discovery (KIE_SERVER_CONTROLLER_OPENSIFT_GLOBAL_DISCOVERY_ENABLED)**: Set this parameter to **true** if you want Business Central Monitoring to discover all KIE Servers with the **OpenShiftStartupStrategy** in the same namespace. By default, Business Central Monitoring discovers only KIE Servers that are deployed with the same value of the **APPLICATION_NAME** parameter as Business Central Monitoring itself.
- **Maven repository URL (MAVEN_REPO_URL)**: A URL for a Maven repository. You must upload all the processes (KJAR files) that are to be deployed on any KIE Servers in your environment into this repository.
- **Maven repository ID (MAVEN_REPO_ID)**: An identifier for the Maven repository. The default value is **repo-custom**.
- **Maven repository username (MAVEN_REPO_USERNAME)**: The user name for the Maven repository.
- **Maven repository password (MAVEN_REPO_PASSWORD)**: The password for the Maven repository.
- **KIE Server Mode (KIE_SERVER_MODE)**: In the **rhcam78-managed.yaml** template the default value is **PRODUCTION**. In **PRODUCTION** mode, you cannot deploy **SNAPSHOT** versions of KJAR artifacts on the KIE Server and cannot change versions of an artifact in an existing container. To deploy a new version with **PRODUCTION** mode, create a new container on the same KIE Server. To deploy **SNAPSHOT** versions or to change versions of an artifact in an existing container, set this parameter to **DEVELOPMENT**.
- **ImageStream Namespace (IMAGE_STREAM_NAMESPACE)**: The namespace where the image streams are available. If the image streams were already available in your OpenShift environment (see [Section 2.1, “Ensuring the availability of image streams and the image registry”](#)), the namespace is **openshift**. If you have installed the image streams file, the namespace is the name of the OpenShift project.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.1.8, “Completing deployment of the template for monitoring and a single KIE Server”](#).

3.1.3. Configuring pod replica numbers for monitoring and a single KIE Server

When configuring the template to deploy Business Central Monitoring and a single managed KIE Server, you can set the initial number of replicas for KIE Server and Business Central Monitoring.

Prerequisites

- You started the configuration of the template, as described in [Section 3.1.1, “Starting configuration of the template for monitoring and a single KIE Server”](#).

Procedure

To configure the numbers of replicas, set the following parameters:

- **Business Central Monitoring Container Replicas** (**BUSINESS_CENTRAL_MONITORING_CONTAINER_REPLICAS**): The number of replicas that the deployment initially creates for Business Central Monitoring. If you do not want to use a high-availability configuration for Business Central Monitoring, set this number to 1.
- **KIE Server Container Replicas**(**KIE_SERVER_CONTAINER_REPLICAS**): The number of replicas that the deployment initially creates for KIE Server.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.1.8, “Completing deployment of the template for monitoring and a single KIE Server”](#).

3.1.4. Configuring access to a Maven mirror in an environment without a connection to the public Internet for monitoring and a single KIE Server

When configuring the template to deploy Business Central Monitoring and a single managed KIE Server, if your OpenShift environment does not have a connection to the public Internet, you must configure access to a Maven mirror that you set up according to [Section 2.7, “Preparing a Maven mirror repository for offline use”](#).

Prerequisites

- You started the configuration of the template, as described in [Section 3.1.1, “Starting configuration of the template for monitoring and a single KIE Server”](#).

Procedure

To configure access to the Maven mirror, set the following parameters:

- **Maven mirror URL** (**MAVEN_MIRROR_URL**): The URL for the Maven mirror repository that you set up in [Section 2.7, “Preparing a Maven mirror repository for offline use”](#) . This URL must be accessible from a pod in your OpenShift environment.
- **Maven mirror of** (**MAVEN_MIRROR_OF**): The value that determines which artifacts are to be retrieved from the mirror. For instructions about setting the **mirrorOf** value, see [Mirror Settings](#) in the Apache Maven documentation. The default value is **external:***. With this value, Maven retrieves every required artifact from the mirror and does not query any other repositories.
 - If you configure an external Maven repository (**MAVEN_REPO_URL**), change **MAVEN_MIRROR_OF** to exclude the artifacts in this repository from the mirror, for example, **external:*,!repo-custom**. Replace **repo-custom** with the ID that you configured in **MAVEN_REPO_ID**.
 - If you configure a built-in Business Central Maven repository (**BUSINESS_CENTRAL_MAVEN_SERVICE**), change **MAVEN_MIRROR_OF** to exclude the artifacts in this repository from the mirror: **external:*,!repo-rhcamcentr**.
 - If you configure both repositories, change **MAVEN_MIRROR_OF** to exclude the artifacts in both repositories from the mirror: **external:*,!repo-rhcamcentr,!repo-custom**. Replace **repo-custom** with the ID that you configured in **MAVEN_REPO_ID**.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.1.8, “Completing deployment of the template for monitoring and a single KIE Server”](#).

3.1.5. Setting parameters for RH-SSO authentication for monitoring and a single KIE Server

If you want to use RH-SSO authentication, complete the following additional configuration when configuring the template to deploy Business Central Monitoring and a single managed KIE Server.



IMPORTANT

Do not configure LDAP authentication and RH-SSO authentication in the same deployment.

Prerequisites

- A realm for Red Hat Process Automation Manager is created in the RH-SSO authentication system.
- User names and passwords for Red Hat Process Automation Manager are created in the RH-SSO authentication system. For a list of the available roles, see [Chapter 4, Red Hat Process Automation Manager roles and users](#).
You must create a user with the username and password configured in the secret for the administrative user, as described in [Section 2.4, “Creating the secret for the administrative user”](#). This user must have the **kie-server,rest-all,admin** roles.
- Clients are created in the RH-SSO authentication system for all components of the Red Hat Process Automation Manager environment that you are deploying. The client setup contains the URLs for the components. You can review and edit the URLs after deploying the environment. Alternatively, the Red Hat Process Automation Manager deployment can create the clients. However, this option provides less detailed control over the environment.
- You started the configuration of the template, as described in [Section 3.1.1, “Starting configuration of the template for monitoring and a single KIE Server”](#).

Procedure

1. Set the following parameters:
 - **RH-SSO URL (SSO_URL)**: The URL for RH-SSO.
 - **RH-SSO Realm name (SSO_REALM)**: The RH-SSO realm for Red Hat Process Automation Manager.
 - **RH-SSO Disable SSL Certificate Validation (SSO_DISABLE_SSL_CERTIFICATE_VALIDATION)**: Set to **true** if your RH-SSO installation does not use a valid HTTPS certificate.
2. Complete one of the following procedures:
 - a. If you created the clients for Red Hat Process Automation Manager within RH-SSO, set the following parameters in the template:

- **Business Central Monitoring RH-SSO Client name** (**BUSINESS_CENTRAL_SSO_CLIENT**): The RH-SSO client name for Business Central Monitoring.
 - **Business Central Monitoring RH-SSO Client Secret** (**BUSINESS_CENTRAL_SSO_SECRET**): The secret string that is set in RH-SSO for the client for Business Central Monitoring.
 - **KIE Server RH-SSO Client name**(**KIE_SERVER_SSO_CLIENT**): The RH-SSO client name for KIE Server.
 - **KIE Server RH-SSO Client Secret**(**KIE_SERVER_SSO_SECRET**): The secret string that is set in RH-SSO for the client for KIE Server.
- b. To create the clients for Red Hat Process Automation Manager within RH-SSO, set the following parameters in the template:
- **Business Central Monitoring RH-SSO Client name** (**BUSINESS_CENTRAL_SSO_CLIENT**): The name of the client to create in RH-SSO for Business Central Monitoring.
 - **Business Central Monitoring RH-SSO Client Secret** (**BUSINESS_CENTRAL_SSO_SECRET**): The secret string to set in RH-SSO for the client for Business Central Monitoring.
 - **KIE Server RH-SSO Client name**(**KIE_SERVER_SSO_CLIENT**): The name of the client to create in RH-SSO for KIE Server.
 - **KIE Server RH-SSO Client Secret**(**KIE_SERVER_SSO_SECRET**): The secret string to set in RH-SSO for the client for KIE Server.
 - **RH-SSO Realm Admin Username**(**SSO_USERNAME**) and **RH-SSO Realm Admin Password** (**SSO_PASSWORD**): The user name and password for the realm administrator user for the RH-SSO realm for Red Hat Process Automation Manager. You must provide this user name and password in order to create the required clients.

Next steps

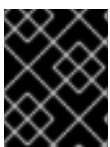
If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.1.8, "Completing deployment of the template for monitoring and a single KIE Server"](#).

After completing the deployment, review the URLs for components of Red Hat Process Automation Manager in the RH-SSO authentication system to ensure they are correct.

3.1.6. Setting parameters for LDAP authentication for monitoring and a single KIE Server

If you want to use LDAP authentication, complete the following additional configuration when configuring the template to deploy Business Central Monitoring and a single managed KIE Server.



IMPORTANT

Do not configure LDAP authentication and RH-SSO authentication in the same deployment.

Prerequisites

- You created user names and passwords for Red Hat Process Automation Manager in the LDAP system. For a list of the available roles, see [Chapter 4, Red Hat Process Automation Manager roles and users](#).

You must create a user with the username and password configured in the secret for the administrative user, as described in [Section 2.4, “Creating the secret for the administrative user”](#). This user must have the **kie-server,rest-all,admin** roles.

- You started the configuration of the template, as described in [Section 3.1.1, “Starting configuration of the template for monitoring and a single KIE Server”](#).

Procedure

1. Set the **AUTH_LDAP*** parameters of the template. These parameters correspond to the settings of the **LdapExtended** Login module of Red Hat JBoss EAP. For instructions about using these settings, see [LdapExtended login module](#).

If the LDAP server does not define all the roles required for your deployment, you can map LDAP groups to Red Hat Process Automation Manager roles. To enable LDAP role mapping, set the following parameters:

- **RoleMapping rolesProperties file path (AUTH_ROLE_MAPPER_ROLES_PROPERTIES)**: The fully qualified path name of a file that defines role mapping, for example, **/opt/eap/standalone/configuration/rolemapping/rolemapping.properties**. You must provide this file and mount it at this path in all applicable deployment configurations; for instructions, see [Section 3.4, “\(Optional\) Providing the LDAP role mapping file”](#).
- **RoleMapping replaceRole property (AUTH_ROLE_MAPPER_REPLACE_ROLE)**: If set to **true**, mapped roles replace the roles defined on the LDAP server; if set to **false**, both mapped roles and roles defined on the LDAP server are set as user application roles. The default setting is **false**.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.1.8, “Completing deployment of the template for monitoring and a single KIE Server”](#).

3.1.7. Enabling Prometheus metric collection for monitoring and a single KIE Server

If you want to configure your KIE Server deployment to use Prometheus to collect and store metrics, enable support for this feature in KIE Server at deployment time.

Prerequisites

- You started the configuration of the template, as described in [Section 3.1.1, “Starting configuration of the template for monitoring and a single KIE Server”](#).

Procedure

To enable support for Prometheus metric collection, set the **Prometheus Server Extension Disabled (PROMETHEUS_SERVER_EXT_DISABLED)** parameter to **false**.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.1.8, “Completing deployment of the template for monitoring and a single KIE Server”](#).

For instructions about configuring Prometheus metrics collection, see [Managing and monitoring KIE Server](#).

3.1.8. Completing deployment of the template for monitoring and a single KIE Server

After setting all the required parameters in the OpenShift Web UI or in the command line, complete deployment of the template.

Procedure

Depending on the method that you are using, complete the following steps:

- In the OpenShift Web UI, click **Create**.
 - If the **This will create resources that may have security or project behavior implications** message appears, click **Create Anyway**.
- Complete the command line and press Enter.

3.2. DEPLOYING AN ADDITIONAL MANAGED KIE SERVER FOR A FREEFORM ENVIRONMENT

You can add a managed KIE Server to a freeform environment. This server can use a PostgreSQL or MySQL database server in a pod or an external database server.

Deploy the server in the same project as the Business Central Monitoring deployment.

The KIE Server loads services from a Maven repository.

The server starts with no loaded services. Use Business Central Monitoring or the REST API of the KIE Server to deploy and undeploy services on the server.

3.2.1. Starting configuration of the template for an additional managed KIE Server

To deploy an additional managed KIE Server, use one of the following template files:

- **rhpam78-kieserver-postgresql.yaml** to use a PostgreSQL pod for persistent storage. Use this template unless you have a specific reason to use another template.
- **rhpam78-kieserver-mysql.yaml** to use a MySQL pod for persistent storage.
- **rhpam78-kieserver-externaldb.yaml** to use an external database server for persistent storage.



IMPORTANT

The standard KIE Server image for an external database server includes drivers for MySQL and PostgreSQL external database servers. If you want to use another database server, you must build a custom KIE Server image. For instructions, see [Section 2.5, “Building a custom KIE Server extension image for an external database”](#).

Procedure

1. Download the **rhpan-7.8.0-openshift-templates.zip** product deliverable file from the [Software Downloads](#) page of the Red Hat Customer Portal.
2. Extract the required template file.
3. Use one of the following methods to start deploying the template:
 - To use the OpenShift Web UI, in the OpenShift application console select **Add to Project** → **Import YAML / JSON** and then select or paste the **<template-file-name>.yaml** file. In the **Add Template** window, ensure **Process the template** is selected and click **Continue**.
 - To use the OpenShift command line console, prepare the following command line:

```
oc new-app -f <template-path>/<template-file-name>.yaml -p
KIE_SERVER_HTTPS_SECRET=kieserver-app-secret -p PARAMETER=value
```

In this command line, make the following changes:

- Replace **<template-path>** with the path to the downloaded template file.
- Replace **<template-file-name>** with the name of the template file.
- Use as many **-p PARAMETER=value** pairs as needed to set the required parameters.

Next steps

Set the parameters for the template. Follow the steps in [Section 3.2.2, “Setting required parameters for an additional managed KIE Server”](#) to set common parameters. You can view the template file to see descriptions for all parameters.

3.2.2. Setting required parameters for an additional managed KIE Server

When configuring the template to deploy an additional managed KIE Server, you must set the following parameters in all cases.

Prerequisites

- You started the configuration of the template, as described in [Section 3.2.1, “Starting configuration of the template for an additional managed KIE Server”](#).

Procedure

1. Set the following parameters:

- **Credentials secret (CREDENTIALS_SECRET)**: The name of the secret containing the administrative user credentials, as created in [Section 2.4, "Creating the secret for the administrative user"](#).
- **KIE Server Keystore Secret Name (KIE_SERVER_HTTPS_SECRET)**: The name of the secret for KIE Server, as created in [Section 2.2, "Creating the secrets for KIE Server"](#).
- **KIE Server Certificate Name (KIE_SERVER_HTTPS_NAME)**: The name of the certificate in the keystore that you created in [Section 2.2, "Creating the secrets for KIE Server"](#).
- **KIE Server Keystore Password (KIE_SERVER_HTTPS_PASSWORD)**: The password for the keystore that you created in [Section 2.2, "Creating the secrets for KIE Server"](#).
- **Application Name (APPLICATION_NAME)**: The name of the OpenShift application. It is used in the default URLs for Business Central Monitoring and KIE Server. OpenShift uses the application name to create a separate set of deployment configurations, services, routes, labels, and artifacts. You can deploy several applications using the same template into the same project, as long as you use different application names. Also, the application name determines the name of the server configuration (server template) that the KIE Server joins on Business Central Monitoring. If you are deploying several KIE Servers, you must ensure each of the servers has a different application name.
- **Maven repository URL (MAVEN_REPO_URL)**: A URL for a Maven repository. You must upload all the processes (KJAR files) that are to be deployed on the KIE Server into this repository.
- **Maven repository ID (MAVEN_REPO_ID)**: An identifier for the Maven repository. The default value is **repo-custom**.
- **Maven repository username (MAVEN_REPO_USERNAME)**: The user name for the Maven repository.
- **Maven repository password (MAVEN_REPO_PASSWORD)**: The password for the Maven repository.
- **KIE Server Mode (KIE_SERVER_MODE)**: In the **rhcam78-kieserver-*.yaml** templates the default value is **PRODUCTION**. In **PRODUCTION** mode, you cannot deploy **SNAPSHOT** versions of KJAR artifacts on the KIE Server and cannot change versions of an artifact in an existing container. To deploy a new version with **PRODUCTION** mode, create a new container on the same KIE Server. To deploy **SNAPSHOT** versions or to change versions of an artifact in an existing container, set this parameter to **DEVELOPMENT**.
- **ImageStream Namespace (IMAGE_STREAM_NAMESPACE)**: The namespace where the image streams are available. If the image streams were already available in your OpenShift environment (see [Section 2.1, "Ensuring the availability of image streams and the image registry"](#)), the namespace is **openshift**. If you have installed the image streams file, the namespace is the name of the OpenShift project.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, "Completing deployment of the template for an additional managed KIE Server"](#).

3.2.3. Configuring the image stream namespace for an additional managed KIE Server

If you created image streams in a namespace that is not **openshift**, you must configure the namespace in the template.

If all image streams were already available in your Red Hat OpenShift Container Platform environment, you can skip this procedure.

Prerequisites

- You started the configuration of the template, as described in [Section 3.2.1, “Starting configuration of the template for an additional managed KIE Server”](#).

Procedure

If you installed an image streams file according to instructions in [Section 2.1, “Ensuring the availability of image streams and the image registry”](#), set the **ImageStream Namespace (IMAGE_STREAM_NAMESPACE)** parameter to the name of your OpenShift project.

3.2.4. Configuring information about a Business Central Monitoring instance for an additional managed KIE Server

To enable a connection from the Business Central Monitoring instance that you deployed to the KIE Server, you must configure information about the Business Central Monitoring instance.

The Business Central Monitoring instance must be configured with the same credentials secret (**CREDENTIALS_SECRET**) as the KIE Server.

Prerequisites

- You started the configuration of the template, as described in [Section 3.2.1, “Starting configuration of the template for an additional managed KIE Server”](#).

Procedure

1. Set the following parameters:
 - **Name of the Business Central service (BUSINESS_CENTRAL_SERVICE)**: The OpenShift service name for the Business Central Monitoring.
2. Ensure that the following settings are set to the same value as the same settings for the Business Central Monitoring:
 - **Maven repository URL (MAVEN_REPO_URL)**: A URL for the external Maven repository from which services must be deployed.
 - **Maven repository username (MAVEN_REPO_USERNAME)**: The user name for the Maven repository.
 - **Maven repository password (MAVEN_REPO_PASSWORD)**: The password for the Maven repository.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, “Completing deployment of the template for an additional managed KIE Server”](#).

3.2.5. Configuring access to a Maven mirror in an environment without a connection to the public Internet for an additional managed KIE Server

When configuring the template to deploy an additional managed KIE Server, if your OpenShift environment does not have a connection to the public Internet, you must configure access to a Maven mirror that you set up according to [Section 2.7, "Preparing a Maven mirror repository for offline use"](#) .

Prerequisites

- You started the configuration of the template, as described in [Section 3.2.1, "Starting configuration of the template for an additional managed KIE Server"](#).

Procedure

To configure access to the Maven mirror, set the following parameters:

- **Maven mirror URL (MAVEN_MIRROR_URL)**: The URL for the Maven mirror repository that you set up in [Section 2.7, "Preparing a Maven mirror repository for offline use"](#) . This URL must be accessible from a pod in your OpenShift environment.
- **Maven mirror of (MAVEN_MIRROR_OF)**: The value that determines which artifacts are to be retrieved from the mirror. For instructions about setting the **mirrorOf** value, see [Mirror Settings](#) in the Apache Maven documentation. The default value is **external:***. With this value, Maven retrieves every required artifact from the mirror and does not query any other repositories.
 - If you configure an external Maven repository (**MAVEN_REPO_URL**), change **MAVEN_MIRROR_OF** to exclude the artifacts in this repository from the mirror, for example, **external:*,!repo-custom**. Replace **repo-custom** with the ID that you configured in **MAVEN_REPO_ID**.
 - If you configure a built-in Business Central Maven repository (**BUSINESS_CENTRAL_MAVEN_SERVICE**), change **MAVEN_MIRROR_OF** to exclude the artifacts in this repository from the mirror: **external:*,!repo-rhpamcentr**.
 - If you configure both repositories, change **MAVEN_MIRROR_OF** to exclude the artifacts in both repositories from the mirror: **external:*,!repo-rhpamcentr,!repo-custom**. Replace **repo-custom** with the ID that you configured in **MAVEN_REPO_ID**.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, "Completing deployment of the template for an additional managed KIE Server"](#).

3.2.6. Setting parameters for RH-SSO authentication for an additional managed KIE Server

If you want to use RH-SSO authentication, complete the following additional configuration when configuring the template to deploy an additional managed KIE Server.



IMPORTANT

Do not configure LDAP authentication and RH-SSO authentication in the same deployment.

Prerequisites

- A realm for Red Hat Process Automation Manager is created in the RH-SSO authentication system.
- User names and passwords for Red Hat Process Automation Manager are created in the RH-SSO authentication system. For a list of the available roles, see [Chapter 4, Red Hat Process Automation Manager roles and users](#).
You must create a user with the username and password configured in the secret for the administrative user, as described in [Section 2.4, “Creating the secret for the administrative user”](#). This user must have the **kie-server,rest-all,admin** roles.
- Clients are created in the RH-SSO authentication system for all components of the Red Hat Process Automation Manager environment that you are deploying. The client setup contains the URLs for the components. You can review and edit the URLs after deploying the environment. Alternatively, the Red Hat Process Automation Manager deployment can create the clients. However, this option provides less detailed control over the environment.
- You started the configuration of the template, as described in [Section 3.2.1, “Starting configuration of the template for an additional managed KIE Server”](#).

Procedure

1. Set the following parameters:
 - **RH-SSO URL (SSO_URL)**: The URL for RH-SSO.
 - **RH-SSO Realm name (SSO_REALM)**: The RH-SSO realm for Red Hat Process Automation Manager.
 - **RH-SSO Disable SSL Certificate Validation (SSO_DISABLE_SSL_CERTIFICATE_VALIDATION)**: Set to **true** if your RH-SSO installation does not use a valid HTTPS certificate.
2. Complete one of the following procedures:
 - a. If you created the client for Red Hat Process Automation Manager within RH-SSO, set the following parameters in the template:
 - **Business Central Monitoring RH-SSO Client name (BUSINESS_CENTRAL_SSO_CLIENT)**: The RH-SSO client name for Business Central Monitoring.
 - **KIE Server RH-SSO Client name (KIE_SERVER_SSO_CLIENT)**: The RH-SSO client name for KIE Server.
 - **KIE Server RH-SSO Client Secret (KIE_SERVER_SSO_SECRET)**: The secret string that is set in RH-SSO for the client for KIE Server.
 - b. To create the clients for Red Hat Process Automation Manager within RH-SSO, set the following parameters in the template:
 - **KIE Server RH-SSO Client name (KIE_SERVER_SSO_CLIENT)**: The name of the client to create in RH-SSO for KIE Server.
 - **KIE Server RH-SSO Client Secret (KIE_SERVER_SSO_SECRET)**: The secret string to set in RH-SSO for the client for KIE Server.

- **RH-SSO Realm Admin Username (SSO_USERNAME)** and **RH-SSO Realm Admin Password (SSO_PASSWORD)**: The user name and password for the realm administrator user for the RH-SSO realm for Red Hat Process Automation Manager. You must provide this user name and password in order to create the required clients.

Next steps

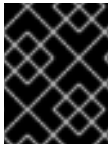
If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, “Completing deployment of the template for an additional managed KIE Server”](#).

After completing the deployment, review the URLs for components of Red Hat Process Automation Manager in the RH-SSO authentication system to ensure they are correct.

3.2.7. Setting parameters for LDAP authentication for an additional managed KIE Server

If you want to use LDAP authentication, complete the following additional configuration when configuring the template to deploy an additional managed KIE Server.



IMPORTANT

Do not configure LDAP authentication and RH-SSO authentication in the same deployment.

Prerequisites

- You created user names and passwords for Red Hat Process Automation Manager in the LDAP system. For a list of the available roles, see [Chapter 4, Red Hat Process Automation Manager roles and users](#).
You must create a user with the username and password configured in the secret for the administrative user, as described in [Section 2.4, “Creating the secret for the administrative user”](#). This user must have the **kie-server,rest-all,admin** roles.
- You started the configuration of the template, as described in [Section 3.2.1, “Starting configuration of the template for an additional managed KIE Server”](#).

Procedure

1. Set the **AUTH_LDAP*** parameters of the template. These parameters correspond to the settings of the **LdapExtended** Login module of Red Hat JBoss EAP. For instructions about using these settings, see [LdapExtended login module](#).

If the LDAP server does not define all the roles required for your deployment, you can map LDAP groups to Red Hat Process Automation Manager roles. To enable LDAP role mapping, set the following parameters:

- **RoleMapping rolesProperties file path (AUTH_ROLE_MAPPER_ROLES_PROPERTIES)**: The fully qualified path name of a file that defines role mapping, for example, **/opt/eap/standalone/configuration/rolemapping/rolemapping.properties**. You must provide this file and mount it at this path in all applicable deployment configurations; for instructions, see [Section 3.4, “\(Optional\) Providing the LDAP role mapping file”](#).
- **RoleMapping replaceRole property (AUTH_ROLE_MAPPER_REPLACE_ROLE)**: If set

to **true**, mapped roles replace the roles defined on the LDAP server; if set to **false**, both mapped roles and roles defined on the LDAP server are set as user application roles. The default setting is **false**.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, "Completing deployment of the template for an additional managed KIE Server"](#).

3.2.8. Setting parameters for using an external database server for an additional managed KIE Server

If you are using the **rhpam78-kieserver-externaldb.yaml** template to use an external database server for the KIE Server, complete the following additional configuration when configuring the template to deploy an additional managed KIE Server.

Prerequisites

- You started the configuration of the template, as described in [Section 3.2.1, "Starting configuration of the template for an additional managed KIE Server"](#).

Procedure

1. Set the following parameters:

- **KIE Server External Database Driver(KIE_SERVER_EXTERNALDB_DRIVER)**: The driver for the server, depending on the server type:
 - **mysql**
 - **postgresql**
 - **mariadb**
 - **mssql**
 - **db2**
 - **oracle**
 - **sybase**
- **KIE Server External Database User(KIE_SERVER_EXTERNALDB_USER)** and **KIE Server External Database Password (KIE_SERVER_EXTERNALDB_PWD)**: The user name and password for the external database server
- **KIE Server External Database URL(KIE_SERVER_EXTERNALDB_URL)**: The JDBC URL for the external database server



NOTE

If you are using the EnterpriseDB Postgres database server, use an URL starting with **jdbc:postgresql://** and not with **jdbc:edb://**. Alternatively, do not set the URL and set the host and port parameters instead.

- **KIE Server External Database Host**(**KIE_SERVER_EXTERNALDB_SERVICE_HOST**) and **KIE Server External Database Port** (**KIE_SERVER_EXTERNALDB_SERVICE_PORT**): The host name and port number of the external database server. You can set these parameters as an alternative to setting the **KIE_SERVER_EXTERNALDB_URL** parameter.
 - **KIE Server External Database Dialect**(**KIE_SERVER_EXTERNALDB_DIALECT**): The Hibernate dialect for the server, depending on the server type. The common settings are:
 - **org.hibernate.dialect.MySQL5InnoDBDialect**
 - **org.hibernate.dialect.MySQL8Dialect**
 - **org.hibernate.dialect.MariaDB102Dialect**
 - **org.hibernate.dialect.PostgreSQL95Dialect**
 - **org.hibernate.dialect.PostgresPlusDialect** (used for EnterpriseDB Postgres Advanced Server)
 - **org.hibernate.dialect.SQLServer2012Dialect** (used for MS SQL)
 - **org.hibernate.dialect.DB2Dialect**
 - **org.hibernate.dialect.Oracle10gDialect**
 - **org.hibernate.dialect.SybaseASE15Dialect**
For a complete list of supported dialects, see Table A.7 in [Hibernate properties](#) in the Red Hat JBoss EAP documentation.
 - **KIE Server External Database name**(**KIE_SERVER_EXTERNALDB_DB**): The database name to use on the external database server
 - **JDBC Connection Checker class** (**KIE_SERVER_EXTERNALDB_CONNECTION_CHECKER**): The name of the JDBC connection checker class for the database server. Without this information, a database server connection cannot be restored after it is lost, for example, if the database server is rebooted.
 - **JDBC Exception Sorter class** (**KIE_SERVER_EXTERNALDB_EXCEPTION_SORTER**): The name of the JDBC exception sorter class for the database server. Without this information, a database server connection cannot be restored after it is lost, for example, if the database server is rebooted.
2. If you created a custom image for using an external database server, as described in [Section 2.5, “Building a custom KIE Server extension image for an external database”](#), set the following parameters:
 - **Drivers Extension Image** (**EXTENSIONS_IMAGE**): The ImageStreamTag definition of the extension image, for example, **jboss-kie-db2-extension-openshift-image:11.1.4.4**
 - **Drivers ImageStream Namespace** (**EXTENSIONS_IMAGE_NAMESPACE**): The namespace to which you uploaded the extension image, for example, **openshift** or your project namespace.
 3. If you are using a MySQL version 8 external database server, enable the **mysql_native_password** plugin and use it for authentication. For instructions about this pluding, see [Native Pluggable Authentication](#) in the *MySQL 8.0 Reference Manual*.

If you are using a MySQL version 8 image provided by Red Hat on Red Hat OpenShift Container Platform, to enable the plugin, set the **MYSQL_DEFAULT_AUTHENTICATION_PLUGIN** environment variable to **mysql_native_password**.

If you created users on the MySQL version 8 server before enabling the **mysql_native_password** plugin, you must update the **mysql-user** table after you enable the plugin.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, “Completing deployment of the template for an additional managed KIE Server”](#).

3.2.9. Enabling Prometheus metric collection for an additional managed KIE Server

If you want to configure your KIE Server deployment to use Prometheus to collect and store metrics, enable support for this feature in KIE Server at deployment time.

Prerequisites

- You started the configuration of the template, as described in [Section 3.2.1, “Starting configuration of the template for an additional managed KIE Server”](#).

Procedure

To enable support for Prometheus metric collection, set the **Prometheus Server Extension Disabled (PROMETHEUS_SERVER_EXT_DISABLED)** parameter to **false**.

Next steps

If necessary, set additional parameters.

To complete the deployment, follow the procedure in [Section 3.2.10, “Completing deployment of the template for an additional managed KIE Server”](#).

For instructions about configuring Prometheus metrics collection, see [Managing and monitoring KIE Server](#).

3.2.10. Completing deployment of the template for an additional managed KIE Server

After setting all the required parameters in the OpenShift Web UI or in the command line, complete deployment of the template.

Procedure

Depending on the method that you are using, complete the following steps:

- In the OpenShift Web UI, click **Create**.
 - If the **This will create resources that may have security or project behavior implications** message appears, click **Create Anyway**.
- Complete the command line and press Enter.

3.3. (OPTIONAL) PROVIDING A TRUSTSTORE FOR ACCESSING HTTPS SERVERS WITH SELF-SIGNED CERTIFICATES

Components of your Red Hat Process Automation Manager infrastructure might need to use HTTPS access to servers that have a self-signed HTTPS certificate. For example, Business Central Monitoring and KIE Server might need to interact with an internal Nexus repository that uses a self-signed HTTPS server certificate.

In this case, to ensure that HTTPS connections complete successfully, you must provide client certificates for these services using a truststore.

Skip this procedure if you do not need Red Hat Process Automation Manager components to communicate with servers that use self-signed HTTPS server certificates.

Procedure

1. Prepare a truststore with the certificates. Use the following command to create a truststore or to add a certificate to an existing truststore. Add all the necessary certificates to one truststore.

```
keytool -importcert -file certificate-file -alias alias -keyalg algorithm -keysize size -
trustcacerts -noprompt -storetype JKS -keypass truststore-password -storepass truststore-
password -keystore keystore-file
```

Replace the following values:

- ***certificate-file***: The pathname of the certificate that you want to add to the truststore.
- ***alias***: The alias for the certificate in the truststore. If you are adding more than one certificate to the truststore, every certificate must have a unique alias.
- ***algorithm***: The encryption algorithm used for the certificate, typically **RSA**.
- ***size***: The size of the certificate key in bytes, for example, **2048**.
- ***truststore-password***: The password for the truststore.
- ***keystore-file***: The pathname of the truststore file. If the file does not exist, the command creates a new truststore.

The following example command adds a certificate from the **/var/certs/nexus.cer** file to a truststore in the **/var/keystores/custom-truststore.jks** file. The truststore password is **mykeystorepass**.

```
keytool -importcert -file /var/certs/nexus.cer -alias nexus-cert -keyalg RSA -keysize 2048
-trustcacerts -noprompt -storetype JKS -keypass mykeystorepass -storepass
mykeystorepass -keystore /var/keystores/custom-truststore.jks
```

2. Create a secret with the truststore file using the **oc** command, for example:

```
oc create secret generic truststore-secret --from-file=/var/keystores/custom-truststore.jks
```

3. In the deployment for the necessary components of your infrastructure, mount the secret and then set the **JAVA_OPTS_APPEND** option to enable the Java application infrastructure to use the trust store, for example:

```
oc set volume dc/myapp-rhpamcentr --add --overwrite --name=custom-trustore-volume --
mount-path /etc/custom-secret-volume --secret-name=custom-secret
```

```
oc set env dc/myapp-rhpamcentr JAVA_OPTS_APPEND='-
Djavax.net.ssl.trustStore=/etc/custom-secret-volume/custom-trustore.jks -
Djavax.net.ssl.trustStoreType=jks -Djavax.net.ssl.trustStorePassword=mykeystorepass'
```

```
oc set volume dc/myapp-kieserver --add --overwrite --name=custom-trustore-volume --
mount-path /etc/custom-secret-volume --secret-name=custom-secret
```

```
oc set env dc/myapp-kieserver JAVA_OPTS_APPEND='-
Djavax.net.ssl.trustStore=/etc/custom-secret-volume/custom-trustore.jks -
Djavax.net.ssl.trustStoreType=jks -Djavax.net.ssl.trustStorePassword=mykeystorepass'
```

Replace **myapp** with the application name that you set when configuring the template.

3.4. (OPTIONAL) PROVIDING THE LDAP ROLE MAPPING FILE

If you configure the **AUTH_ROLE_MAPPER_ROLES_PROPERTIES** parameter, you must provide a file that defines the role mapping. Mount this file on all affected deployment configurations.

Procedure

1. Create the role mapping properties file, for example, **my-role-map**. The file must contain entries in the following format:

```
ldap_role = product_role1, product_role2...
```

For example:

```
admins = kie-server,rest-all,admin
```

2. Create an OpenShift configuration map from the file by entering the following command:

```
oc create configmap ldap-role-mapping --from-file=<new_name>=<existing_name>
```

Replace **<new_name>** with the name that the file is to have on the pods (it must be the same as the name specified in the **AUTH_ROLE_MAPPER_ROLES_PROPERTIES** file) and **<existing_name>** with the name of the file that you created. Example:

```
oc create configmap ldap-role-mapping --from-file=rolemapping.properties=my-role-map
```

3. Mount the configuration map on every deployment configuration that is configured for role mapping.

The following deployment configurations can be affected in this environment:

Replace **myapp** with the application name. Sometimes, several KIE Server deployments can be present under different application names.

For every deployment configuration, run the command:

```
oc set volume dc/<deployment_config_name> --add --type configmap --configmap-name  
ldap-role-mapping --mount-path=<mapping_dir> --name=ldap-role-mapping
```

Replace **<mapping_dir>** with the directory name (without file name) set in the **AUTH_ROLE_MAPPER_ROLES_PROPERTIES** parameter, for example, **/opt/eap/standalone/configuration/rolemapping** .

CHAPTER 4. RED HAT PROCESS AUTOMATION MANAGER ROLES AND USERS

To access Business Central or KIE Server, you must create users and assign them appropriate roles before the servers are started.

The Business Central and KIE Server use Java Authentication and Authorization Service (JAAS) login module to authenticate the users. If both Business Central and KIE Server are running on a single instance, then they share the same JAAS subject and security domain. Therefore, a user, who is authenticated for Business Central can also access KIE Server.

However, if Business Central and KIE Server are running on different instances, then the JAAS login module is triggered for both individually. Therefore, a user, who is authenticated for Business Central, needs to be authenticated separately to access the KIE Server (for example, to view or manage process definitions in Business Central). In case, the user is not authenticated on the KIE Server, then 401 error is logged in the log file, displaying **Invalid credentials to load data from remote server. Contact your system administrator.** message in Business Central.

This section describes available Red Hat Process Automation Manager user roles.



NOTE

The **admin**, **analyst**, **developer**, **manager**, **process-admin**, **user**, and **rest-all** roles are reserved for Business Central. The **kie-server** role is reserved for KIE Server. For this reason, the available roles can differ depending on whether Business Central, KIE Server, or both are installed.

- **admin:** Users with the **admin** role are the Business Central administrators. They can manage users and create, clone, and manage the repositories. They have full access to make required changes in the application. Users with the **admin** role have access to all areas within Red Hat Process Automation Manager.
- **analyst:** Users with the **analyst** role have access to all high-level features. They can model and execute their projects. However, these users cannot add contributors to spaces or delete spaces in the **Design → Projects** view. Access to the **Deploy → Execution Servers** view, which is intended for administrators, is not available to users with the **analyst** role. However, the **Deploy** button is available to these users when they access the Library perspective.
- **developer:** Users with the **developer** role have access to almost all features and can manage rules, models, process flows, forms, and dashboards. They can manage the asset repository, they can create, build, and deploy projects, and they can use Red Hat CodeReady Studio to view processes. Only certain administrative functions such as creating and cloning a new repository are hidden from users with the **developer** role.
- **manager:** Users with the **manager** role can view reports. These users are usually interested in statistics about the business processes and their performance, business indicators, and other business-related reporting. A user with this role has access only to process and task reports.
- **process-admin:** Users with the **process-admin** role are business process administrators. They have full access to business processes, business tasks, and execution errors. These users can also view business reports and have access to the Task Inbox list.
- **user:** Users with the **user** role can work on the Task Inbox list, which contains business tasks that are part of currently running processes. Users with this role can view process and task reports and manage processes.

- **rest-all**: Users with the **rest-all** role can access Business Central REST capabilities.
- **kie-server**: Users with the **kie-server** role can access KIE Server (KIE Server) REST capabilities. This role is mandatory for users to have access to **Manage** and **Track** views in Business Central.

CHAPTER 5. OPENSIFT TEMPLATE REFERENCE INFORMATION

Red Hat Process Automation Manager provides the following OpenShift templates. To access the templates, download and extract the **rhpmam-7.8.0-openshift-templates.zip** product deliverable file from the [Software Downloads](#) page of the Red Hat customer portal.

- **rhpmam78-managed.yaml** provides a high-availability Business Central Monitoring instance, a KIE Server, and a PostgreSQL instance that the KIE Server uses. **OpenShiftStartupStrategy** is enabled, ensuring that the Business Central Monitoring instance can connect to other KIE Server instances in the same project automatically, as long as these instances have **OpenShiftStartupStrategy** enabled as well.

For reference information about other templates used in this environment, see [the reference section in *Deploying a Red Hat Process Automation Manager immutable server environment on Red Hat OpenShift Container Platform*](#).

5.1. RHPAM78-MANAGED.YAML TEMPLATE

Application template for a managed HA production runtime environment, for Red Hat Process Automation Manager 7.8 - Deprecated

5.1.1. Parameters

Templates allow you to define parameters that take on a value. That value is then substituted wherever the parameter is referenced. References can be defined in any text field in the objects list field. See the [Openshift documentation](#) for more information.

Variable name	Image Environment Variable	Description	Example value	Required
APPLICATION_NAME	–	The name for the application.	myapp	True
MAVEN_MIRROR_URL	MAVEN_MIRROR_URL	Maven mirror that the KIE server must use. If you configure a mirror, this mirror must contain all artifacts that are required for deploying your services.	–	False
MAVEN_MIRROR_OF	MAVEN_MIRROR_OF	Maven mirror configuration for KIE server.	external:*	False

Variable name	Image Environment Variable	Description	Example value	Required
MAVEN_REPO_ID	MAVEN_REPO_ID	The id to use for the maven repository. If set, it can be excluded from the optionally configured mirror by adding it to MAVEN_MIRROR_OF. For example: external:*,!repo-rhpamcentr,!repo-custom. If MAVEN_MIRROR_URL is set but MAVEN_MIRROR_ID is not set, an id will be generated randomly, but won't be usable in MAVEN_MIRROR_OF.	repo-custom	False
MAVEN_REPO_URL	MAVEN_REPO_URL	Fully qualified URL to a Maven repository or service.	http://nexus.nexus-project.svc.cluster.local:8081/nexus/content/groups/public/	True
MAVEN_REPO_USERNAME	MAVEN_REPO_USERNAME	User name for accessing the Maven repository, if required.	–	False
MAVEN_REPO_PASSWORD	MAVEN_REPO_PASSWORD	Password to access the Maven repository, if required.	–	False
BUSINESS_CENTRAL_SERVICE	RHPAMCENTR_MAVEN_REPO_SERVICE	The Service name for the optional Business Central, where it can be reached, to allow service lookups (for example, maven repo usage), if required.	myapp-rhpamcentrmon	False

Variable name	Image Environment Variable	Description	Example value	Required
CREDENTIALS_SECRET	–	Secret containing the KIE_ADMIN_USER and KIE_ADMIN_PWD values	rhpm-credentials	True
KIE_SERVER_CONTROLLER_OPENSHIFT_GLOBAL_DISCOVERY_ENABLED	KIE_SERVER_CONTROLLER_OPENSHIFT_GLOBAL_DISCOVERY_ENABLED	If set to true, turns on KIE server global discovery feature (Sets the org.kie.server.controller.openshift.global.discovery.enabled system property)	false	False
KIE_SERVER_CONTROLLER_OPENSHIFT_PREFER_KIESERVER_SERVICE	KIE_SERVER_CONTROLLER_OPENSHIFT_PREFER_KIESERVER_SERVICE	If OpenShift integration of Business Central is turned on, setting this parameter to true enables connection to KIE Server via an OpenShift internal Service endpoint. (Sets the org.kie.server.controller.openshift.prefer.kieserver.service system property)	true	False
KIE_SERVER_CONTROLLER_TEMPLATE_CACHE_TTL	KIE_SERVER_CONTROLLER_TEMPLATE_CACHE_TTL	KIE ServerTemplate Cache TTL in milliseconds. (Sets the org.kie.server.controller.template.cache.ttl system property)	5000	False

Variable name	Image Environment Variable	Description	Example value	Required
IMAGE_STREAM_NAMESPACE	–	Namespace in which the ImageStreams for Red Hat Process Automation Manager images are installed. These ImageStreams are normally installed in the openshift namespace. You need to modify this parameter only if you installed the ImageStream in a different namespace/project. Default is "openshift".	openshift	True
KIE_SERVER_IMAGE_STREAM_NAME	–	The name of the image stream to use for KIE server. Default is "rhpm-kieserver-rhel8".	rhpm-kieserver-rhel8	True
IMAGE_STREAM_TAG	–	A named pointer to an image in an image stream. Default is "7.8.0".	7.8.0	True
KIE_SERVER_CONTROLLER_TOKEN	KIE_SERVER_CONTROLLER_TOKEN	KIE server controller token for bearer authentication. (Sets the org.kie.server.controller.token.system property)	–	False

Variable name	Image Environment Variable	Description	Example value	Required
KIE_SERVER_PERSISTENCE_DS	KIE_SERVER_PERSISTENCE_DS	KIE server persistence datasource. (Sets the org.kie.server.persistence.ds system property)	java:/jboss/datasources/rhpam	False
POSTGRESQL_IMAGE_STREAM_NAMESPACE	–	Namespace in which the ImageStream for the PostgreSQL image is installed. The ImageStream is already installed in the openshift namespace. You need to modify this parameter only if you installed the ImageStream in a different namespace/project. Default is "openshift".	openshift	False
POSTGRESQL_IMAGE_STREAM_TAG	–	The PostgreSQL image version, which is intended to correspond to the PostgreSQL version. Default is "10".	10	False
KIE_SERVER_POSTGRESQL_USER	RHPAM_USERNAME	KIE server PostgreSQL database user name.	rhpam	False
KIE_SERVER_POSTGRESQL_PASSWORD	RHPAM_PASSWORD	KIE server PostgreSQL database password.	–	False

Variable name	Image Environment Variable	Description	Example value	Required
KIE_SERVER_POSTGRESQL_DATABASE	RHPAM_DATABASE	KIE server PostgreSQL database name.	rhpm7	False
POSTGRESQL_MAX_PREPARED_TRANSACTIONS	POSTGRESQL_MAX_PREPARED_TRANSACTIONS	Allows the PostgreSQL to handle XA transactions.	100	True
DB_VOLUME_CAPACITY	–	Size of persistent storage for the database volume.	1Gi	True
KIE_SERVER_POSTGRESQL_DIALECT	KIE_SERVER_PERSISTENCE_DIALECT	KIE server PostgreSQL Hibernate dialect.	org.hibernate.dialect.PostgreSQLDialect	True
KIE_SERVER_MODE	KIE_SERVER_MODE	The KIE Server mode. Valid values are 'DEVELOPMENT' or 'PRODUCTION'. In production mode, you can not deploy SNAPSHOT versions of artifacts on the KIE server and can not change the version of an artifact in an existing container. (Sets the org.kie.server.mode system property).	PRODUCTION	False
KIE_MBEANS	KIE_MBEANS	KIE server mbeans enabled/disabled (Sets the kie.mbeans and kie.scanner.mbeans system properties)	enabled	False

Variable name	Image Environment Variable	Description	Example value	Required
DROOLS_SERVER_FILTER_CLASSES	DROOLS_SERVER_FILTER_CLASSES	KIE server class filtering. (Sets the org.drools.server.filter.classes.system property)	true	False
PROMETHEUS_SERVER_EXT_DISABLED	PROMETHEUS_SERVER_EXT_DISABLED	If set to false, the prometheus server extension will be enabled. (Sets the org.kie.prometheus.server.ext.disabled system property)	false	False
BUSINESS_CENTRAL_HOSTNAME_HTTP	HOSTNAME_HTTP	Custom hostname for http service route. Leave blank for default hostname, e.g.: insecure-<application-name>-rhpamcentrmon-<project>.<default-domain-suffix>	–	False
BUSINESS_CENTRAL_HOSTNAME_HTTPS	HOSTNAME_HTTPS	Custom hostname for https service route. Leave blank for default hostname, e.g.: <application-name>-rhpamcentrmon-<project>.<default-domain-suffix>	–	False
KIE_SERVER_HOSTNAME_HTTP	HOSTNAME_HTTP	Custom hostname for http service route. Leave blank for default hostname, e.g.: insecure-<application-name>-kieserver-<project>.<default-domain-suffix>	–	False

Variable name	Image Environment Variable	Description	Example value	Required
KIE_SERVER_HOSTNAME_HTTPS	HOSTNAME_HTTPS	Custom hostname for https service route. Leave blank for default hostname, e.g.: <application-name>-kieserver-<project>.<default-domain-suffix>	–	False
BUSINESS_CENTRAL_HTTPS_SECRET	–	The name of the secret containing the keystore file for Business Central.	businesscentral-app-secret	True
BUSINESS_CENTRAL_HTTPS_KEYSTORE	HTTPS_KEYSTORE	The name of the keystore file within the secret.	keystore.jks	False
BUSINESS_CENTRAL_HTTPS_NAME	HTTPS_NAME	The name associated with the server certificate.	jboss	False
BUSINESS_CENTRAL_HTTPS_PASSWORD	HTTPS_PASSWORD	The password for the keystore and certificate.	mykeystorepass	False
KIE_SERVER_HTTPS_SECRET	–	The name of the secret containing the keystore file for KIE server.	kieserver-app-secret	True
KIE_SERVER_HTTPS_KEYSTORE	HTTPS_KEYSTORE	The name of the keystore file within the secret.	keystore.jks	False
KIE_SERVER_HTTPS_NAME	HTTPS_NAME	The name associated with the server certificate.	jboss	False
KIE_SERVER_HTTPS_PASSWORD	HTTPS_PASSWORD	The password for the keystore and certificate.	mykeystorepass	False

Variable name	Image Environment Variable	Description	Example value	Required
KIE_SERVER_BYPASS_AUTH_USER	KIE_SERVER_BYPASS_AUTH_USER	Allows the KIE server to bypass the authenticated user for task-related operations, for example, queries. (Sets the org.kie.server.bypass.auth.user system property)	false	False
TIMER_SERVICE_DATA_STORE_REFRESH_INTERVAL	TIMER_SERVICE_DATA_STORE_REFRESH_INTERVAL	Sets refresh-interval for the EJB timer service database-data-store.	30000	False
BUSINESS_CENTRAL_MEMORY_LIMIT	–	Business Central Monitoring Container memory limit.	2Gi	False
KIE_SERVER_MEMORY_LIMIT	–	KIE server Container memory limit.	1Gi	False
BUSINESS_CENTRAL_MONITORING_CONTAINER_REPLICAS	–	Business Central Monitoring Container Replicas, will define how much Business Central Monitoring containers will be started.	3	True
KIE_SERVER_CONTAINER_REPLICAS	–	KIE Server Container Replicas, will define how much KIE Server containers will be started.	3	True
SSO_URL	SSO_URL	RH-SSO URL.	https://rh-sso.example.com/auth	False

Variable name	Image Environment Variable	Description	Example value	Required
SSO_REALM	SSO_REALM	RH-SSO Realm name.	–	False
BUSINESS_CENTRAL_SSO_CLIENT	SSO_CLIENT	Business Central Monitoring RH-SSO Client name.	–	False
BUSINESS_CENTRAL_SSO_SECRET	SSO_SECRET	Business Central Monitoring RH-SSO Client Secret.	252793ed-7118-4ca8-8dab-5622fa97d892	False
KIE_SERVER_SSO_CLIENT	SSO_CLIENT	KIE Server RH-SSO Client name.	–	False
KIE_SERVER_SSO_SECRET	SSO_SECRET	KIE Server RH-SSO Client Secret.	252793ed-7118-4ca8-8dab-5622fa97d892	False
SSO_USERNAME	SSO_USERNAME	RH-SSO Realm admin user name for creating the Client if it doesn't exist.	–	False
SSO_PASSWORD	SSO_PASSWORD	RH-SSO Realm Admin Password used to create the Client.	–	False
SSO_DISABLE_SSL_CERTIFICATE_VALIDATION	SSO_DISABLE_SSL_CERTIFICATE_VALIDATION	RH-SSO Disable SSL Certificate Validation.	false	False
SSO_PRINCIPAL_ATTRIBUTE	SSO_PRINCIPAL_ATTRIBUTE	RH-SSO Principal Attribute to use as user name.	preferred_username	False
AUTH_LDAP_URL	AUTH_LDAP_URL	LDAP Endpoint to connect for authentication.	ldap://myldap.example.com	False
AUTH_LDAP_BIND_DN	AUTH_LDAP_BIND_DN	Bind DN used for authentication.	uid=admin,ou=users,ou=example,ou=com	False

Variable name	Image Environment Variable	Description	Example value	Required
AUTH_LDAP_BIND_CREDENTIAL	AUTH_LDAP_BIND_CREDENTIAL	LDAP Credentials used for authentication.	Password	False
AUTH_LDAP_JAAS_SECURITY_DOMAIN	AUTH_LDAP_JAAS_SECURITY_DOMAIN	The JMX ObjectName of the JaasSecurityDomain used to decrypt the password.	–	False
AUTH_LDAP_BASE_CTX_DN	AUTH_LDAP_BASE_CTX_DN	LDAP Base DN of the top-level context to begin the user search.	ou=users,ou=example,ou=com	False
AUTH_LDAP_BASE_FILTER	AUTH_LDAP_BASE_FILTER	LDAP search filter used to locate the context of the user to authenticate. The input username or userDN obtained from the login module callback is substituted into the filter anywhere a {0} expression is used. A common example for the search filter is (uid={0}).	(uid={0})	False
AUTH_LDAP_SEARCH_SCOPE	AUTH_LDAP_SEARCH_SCOPE	The search scope to use.	SUBTREE_SCOPE	False
AUTH_LDAP_SEARCH_TIME_LIMIT	AUTH_LDAP_SEARCH_TIME_LIMIT	The timeout in milliseconds for user or role searches.	10000	False

Variable name	Image Environment Variable	Description	Example value	Required
AUTH_LDAP_DISTINGUISHED_NAME_ATTRIBUTE	AUTH_LDAP_DISTINGUISHED_NAME_ATTRIBUTE	The name of the attribute in the user entry that contains the DN of the user. This may be necessary if the DN of the user itself contains special characters, backslash for example, that prevent correct user mapping. If the attribute does not exist, the entry's DN is used.	distinguishedName	False
AUTH_LDAP_PARSE_USERNAME	AUTH_LDAP_PARSE_USERNAME	A flag indicating if the DN is to be parsed for the user name. If set to true, the DN is parsed for the user name. If set to false the DN is not parsed for the user name. This option is used together with <code>usernameBeginString</code> and <code>usernameEndString</code> .	true	False
AUTH_LDAP_USERNAME_BEGIN_STRING	AUTH_LDAP_USERNAME_BEGIN_STRING	Defines the String which is to be removed from the start of the DN to reveal the user name. This option is used together with <code>usernameEndString</code> and only taken into account if <code>parseUsername</code> is set to true.	–	False

Variable name	Image Environment Variable	Description	Example value	Required
AUTH_LDAP_USERNAME_END_STRING	AUTH_LDAP_USERNAME_END_STRING	Defines the String which is to be removed from the end of the DN to reveal the user name. This option is used together with <code>usernameEndString</code> and only taken into account if <code>parseUsername</code> is set to true.	–	False
AUTH_LDAP_ROLE_ATTRIBUTE_ID	AUTH_LDAP_ROLE_ATTRIBUTE_ID	Name of the attribute containing the user roles.	<code>memberOf</code>	False
AUTH_LDAP_ROLES_CTX_DN	AUTH_LDAP_ROLES_CTX_DN	The fixed DN of the context to search for user roles. This is not the DN where the actual roles are, but the DN where the objects containing the user roles are. For example, in a Microsoft Active Directory server, this is the DN where the user account is.	<code>ou=groups,ou=example,ou=com</code>	False

Variable name	Image Environment Variable	Description	Example value	Required
AUTH_LDAP_ROLE_FILTER	AUTH_LDAP_ROLE_FILTER	A search filter used to locate the roles associated with the authenticated user. The input username or userDN obtained from the login module callback is substituted into the filter anywhere a {0} expression is used. The authenticated userDN is substituted into the filter anywhere a {1} is used. An example search filter that matches on the input username is (member={0}). An alternative that matches on the authenticated userDN is (member={1}).	(memberOf={1})	False
AUTH_LDAP_ROLE_RECURSION	AUTH_LDAP_ROLE_RECURSION	The number of levels of recursion the role search will go below a matching context. Disable recursion by setting this to 0.	1	False
AUTH_LDAP_DEFAULT_ROLE	AUTH_LDAP_DEFAULT_ROLE	A role included for all authenticated users	user	False

Variable name	Image Environment Variable	Description	Example value	Required
AUTH_LDAP_ROLE_NAME_ATTRIBUTE_ID	AUTH_LDAP_ROLE_NAME_ATTRIBUTE_ID	Name of the attribute within the roleCtxDN context which contains the role name. If the roleAttributesDN property is set to true, this property is used to find the role object's name attribute.	name	False
AUTH_LDAP_PARSE_ROLE_NAME_FROM_DN	AUTH_LDAP_PARSE_ROLE_NAME_FROM_DN	A flag indicating if the DN returned by a query contains the roleNameAttribute ID. If set to true, the DN is checked for the roleNameAttribute ID. If set to false, the DN is not checked for the roleNameAttribute ID. This flag can improve the performance of LDAP queries.	false	False
AUTH_LDAP_ROLE_ATTRIBUTE_IS_DN	AUTH_LDAP_ROLE_ATTRIBUTE_IS_DN	Whether or not the roleAttributeID contains the fully-qualified DN of a role object. If false, the role name is taken from the value of the roleNameAttributeId attribute of the context name. Certain directory schemas, such as Microsoft Active Directory, require this attribute to be set to true.	false	False

Variable name	Image Environment Variable	Description	Example value	Required
AUTH_LDAP_REFERRAL_USE_ROLE_ATTRIBUTE_ID_TO_CHECK	AUTH_LDAP_REFERRAL_USE_ROLE_ATTRIBUTE_ID_TO_CHECK	If you are not using referrals, you can ignore this option. When using referrals, this option denotes the attribute name which contains users defined for a certain role, for example member, if the role object is inside the referral. Users are checked against the content of this attribute name. If this option is not set, the check will always fail, so role objects cannot be stored in a referral tree.	–	False
AUTH_ROLE_MAPPER_ROLES_PROPERTIES	AUTH_ROLE_MAPPER_ROLES_PROPERTIES	When present, the RoleMapping Login Module will be configured to use the provided file. This parameter defines the fully-qualified file path and name of a properties file or resource which maps roles to replacement roles. The format is original_role=role1,role2,role3	–	False
AUTH_ROLE_MAPPER_REPLACE_ROLE	AUTH_ROLE_MAPPER_REPLACE_ROLE	Whether to add to the current roles, or replace the current roles with the mapped ones. Replaces if set to true.	–	False

5.1.2. Objects

The CLI supports various object types. A list of these object types as well as their abbreviations can be found in the [Openshift documentation](#).

5.1.2.1. Services

A service is an abstraction which defines a logical set of pods and a policy by which to access them. See the [container-engine documentation](#) for more information.

Service	Port	Name	Description
\${APPLICATION_NAME}-rhpamcentrmon	8080	http	All the Business Central Monitoring web server's ports.
	8443	https	
\${APPLICATION_NAME}-rhpamcentrmon-ping	8888	ping	The JGroups ping port for clustering.
\${APPLICATION_NAME}-kieserver	8080	http	All the KIE server web server's ports. (First KIE server)
	8443	https	
\${APPLICATION_NAME}-kieserver-ping	8888	ping	The JGroups ping port for clustering.
\${APPLICATION_NAME}-postgresql	5432	–	The first database server's port.

5.1.2.2. Routes

A route is a way to expose a service by giving it an externally reachable hostname such as **www.example.com**. A defined route and the endpoints identified by its service can be consumed by a router to provide named connectivity from external clients to your applications. Each route consists of a route name, service selector, and (optionally) security configuration. See the [Openshift documentation](#) for more information.

Service	Security	Hostname
insecure- \${APPLICATION_NAME}-rhpamcentrmon-http	none	\${BUSINESS_CENTRAL_HOSTNAME_HTTP}
\${APPLICATION_NAME}-rhpamcentrmon-https	TLS passthrough	\${BUSINESS_CENTRAL_HOSTNAME_HTTPS}

Service	Security	Hostname
insecure- \${APPLICATION_NAME}- kieserver-http	none	\${KIE_SERVER_HOSTNAME}_HTTP}
\${APPLICATION_NAME}-kieserver-https	TLS passthrough	\${KIE_SERVER_HOSTNAME}_HTTPS}

5.1.2.3. Deployment Configurations

A deployment in OpenShift is a replication controller based on a user-defined template called a deployment configuration. Deployments are created manually or in response to triggered events. See the [OpenShift documentation](#) for more information.

5.1.2.3.1. Triggers

A trigger drives the creation of new deployments in response to events, both inside and outside OpenShift. See the [OpenShift documentation](#) for more information.

Deployment	Triggers
\${APPLICATION_NAME}-rhpamcentrmon	ImageChange
\${APPLICATION_NAME}-kieserver	ImageChange
\${APPLICATION_NAME}-postgresql	ImageChange

5.1.2.3.2. Replicas

A replication controller ensures that a specified number of pod "replicas" are running at any one time. If there are too many, the replication controller kills some pods. If there are too few, it starts more. See the [container-engine documentation](#) for more information.

Deployment	Replicas
\${APPLICATION_NAME}-rhpamcentrmon	3
\${APPLICATION_NAME}-kieserver	3
\${APPLICATION_NAME}-postgresql	1

5.1.2.3.3. Pod Template

5.1.2.3.3.1. Service Accounts

Service accounts are API objects that exist within each project. They can be created or deleted like any other API object. See the [OpenShift documentation](#) for more information.

Deployment	Service Account
<code>\${APPLICATION_NAME}-rhpamcentrmon</code>	<code>\${APPLICATION_NAME}-rhpamsvc</code>
<code>\${APPLICATION_NAME}-kieserver</code>	<code>\${APPLICATION_NAME}-rhpamsvc</code>

5.1.2.3.3.2. Image

Deployment	Image
<code>\${APPLICATION_NAME}-rhpamcentrmon</code>	<code>rhpam-businesscentral-monitoring-rhel8</code>
<code>\${APPLICATION_NAME}-kieserver</code>	<code>\${KIE_SERVER_IMAGE_STREAM_NAME}</code>
<code>\${APPLICATION_NAME}-postgresql</code>	<code>postgresql</code>

5.1.2.3.3.3. Readiness Probe

`${APPLICATION_NAME}-rhpamcentrmon`

Http Get on `http://localhost:8080/rest/ready`

`${APPLICATION_NAME}-kieserver`

Http Get on `http://localhost:8080/services/rest/server/readycheck`

`${APPLICATION_NAME}-postgresql`

`/usr/libexec/check-container`

5.1.2.3.3.4. Liveness Probe

`${APPLICATION_NAME}-rhpamcentrmon`

Http Get on `http://localhost:8080/rest/healthy`

`${APPLICATION_NAME}-kieserver`

Http Get on `http://localhost:8080/services/rest/server/healthcheck`

`${APPLICATION_NAME}-postgresql`

`/usr/libexec/check-container --live`

5.1.2.3.3.5. Exposed Ports

Deployments	Name	Port	Protocol
\${APPLICATION_NAME}-rhpamcentrmon	jolokia	8778	TCP
	http	8080	TCP
	https	8443	TCP
	ping	8888	TCP
\${APPLICATION_NAME}-kieserver	jolokia	8778	TCP
	http	8080	TCP
	https	8443	TCP
	ping	8888	TCP
\${APPLICATION_NAME}-postgresql	–	5432	TCP

5.1.2.3.3.6. Image Environment Variables

Deployment	Variable name	Description	Example value
\${APPLICATION_NAME}-rhpamcentrmon	APPLICATION_USE_RS_PROPERTIES	–	/opt/kie/data/configuration/application-users.properties
	APPLICATION_ROLES_PROPERTIES	–	/opt/kie/data/configuration/application-roles.properties
	KIE_ADMIN_USER	Admin user name	Set according to the credentials secret
	KIE_ADMIN_PWD	Admin user password	Set according to the credentials secret
	MAVEN_MIRROR_URL	Maven mirror that the KIE server must use. If you configure a mirror, this mirror must contain all artifacts that are required for deploying your services.	\${MAVEN_MIRROR_URL}

Deployment	Variable name	Description	Example value
	MAVEN_REPO_ID	The id to use for the maven repository. If set, it can be excluded from the optionally configured mirror by adding it to MAVEN_MIRROR_OF. For example: external:*,!repo-rhpamcentr,!repo-custom. If MAVEN_MIRROR_URL is set but MAVEN_MIRROR_ID is not set, an id will be generated randomly, but won't be usable in MAVEN_MIRROR_OF.	\${MAVEN_REPO_ID}
	MAVEN_REPO_URL	Fully qualified URL to a Maven repository or service.	\${MAVEN_REPO_URL}
	MAVEN_REPO_USERNAME	User name for accessing the Maven repository, if required.	\${MAVEN_REPO_USERNAME}
	MAVEN_REPO_PASSWORD	Password to access the Maven repository, if required.	\${MAVEN_REPO_PASSWORD}
	KIE_SERVER_CONTROLLER_OPENSIFT_ENABLED	–	true
	KIE_SERVER_CONTROLLER_GLOBAL_DISCOVERY_ENABLED	If set to true, turns on KIE server global discovery feature (Sets the org.kie.server.controller.openshift.global.discovery.enabled system property)	\${KIE_SERVER_CONTROLLER_GLOBAL_DISCOVERY_ENABLED}

Deployment	Variable name	Description	Example value
	KIE_SERVER_CONTROLLER_OPENSHIFT_PREFER_KIESERVER_SERVICE	If OpenShift integration of Business Central is turned on, setting this parameter to true enables connection to KIE Server via an OpenShift internal Service endpoint. (Sets the org.kie.server.controller.openshift.prefer.kieserver.service system property)	\${KIE_SERVER_CONTROLLER_OPENSHIFT_PREFER_KIESERVER_SERVICE}
	KIE_SERVER_CONTROLLER_TEMPLATE_CACHE_TTL	KIE ServerTemplate Cache TTL in milliseconds. (Sets the org.kie.server.controller.template.cache.ttl system property)	\${KIE_SERVER_CONTROLLER_TEMPLATE_CACHE_TTL}
	KIE_SERVER_CONTROLLER_TOKEN	KIE server controller token for bearer authentication. (Sets the org.kie.server.controller.token system property)	\${KIE_SERVER_CONTROLLER_TOKEN}
	HTTPS_KEYSTORE_DIR	–	/etc/businesscentral-secret-volume
	HTTPS_KEYSTORE	The name of the keystore file within the secret.	\${BUSINESS_CENTRAL_HTTPS_KEYSTORE}
	HTTPS_NAME	The name associated with the server certificate.	\${BUSINESS_CENTRAL_HTTPS_NAME}
	HTTPS_PASSWORD	The password for the keystore and certificate.	\${BUSINESS_CENTRAL_HTTPS_PASSWORD}
	JGROUPS_PING_PROTOCOL	–	openshift.DNS_PING

Deployment	Variable name	Description	Example value
	OPENSIFT_DNS_PING_SERVICE_NAME	–	\${APPLICATION_NAME}-rhpamcentrmon-ping
	OPENSIFT_DNS_PING_SERVICE_PORT	–	8888
	SSO_URL	RH-SSO URL.	\${SSO_URL}
	SSO_OPENIDCONNECT_DEPLOYMENTS	–	ROOT.war
	SSO_REALM	RH-SSO Realm name.	\${SSO_REALM}
	SSO_SECRET	Business Central Monitoring RH-SSO Client Secret.	\${BUSINESS_CENTRAL_SSO_SECRET}
	SSO_CLIENT	Business Central Monitoring RH-SSO Client name.	\${BUSINESS_CENTRAL_SSO_CLIENT}
	SSO_USERNAME	RH-SSO Realm admin user name for creating the Client if it doesn't exist.	\${SSO_USERNAME}
	SSO_PASSWORD	RH-SSO Realm Admin Password used to create the Client.	\${SSO_PASSWORD}
	SSO_DISABLE_SSL_CERTIFICATE_VALIDATION	RH-SSO Disable SSL Certificate Validation.	\${SSO_DISABLE_SSL_CERTIFICATE_VALIDATION}
	SSO_PRINCIPAL_ATTRIBUTE	RH-SSO Principal Attribute to use as user name.	\${SSO_PRINCIPAL_ATTRIBUTE}
	HOSTNAME_HTTP	Custom hostname for http service route. Leave blank for default hostname, e.g.: insecure-<application-name>-rhpamcentrmon-<project>.<default-domain-suffix>	\${BUSINESS_CENTRAL_HOSTNAME_HTTP}

Deployment	Variable name	Description	Example value
	HOSTNAME_HTTPS	Custom hostname for https service route. Leave blank for default hostname, e.g.: <application-name>-rhpamcentrmon-<project>.<default-domain-suffix>	`\${BUSINESS_CENTRAL_HOSTNAME_HTTPS}`
	AUTH_LDAP_URL	LDAP Endpoint to connect for authentication.	`\${AUTH_LDAP_URL}`
	AUTH_LDAP_BIND_DN	Bind DN used for authentication.	`\${AUTH_LDAP_BIND_DN}`
	AUTH_LDAP_BIND_CREDENTIAL	LDAP Credentials used for authentication.	`\${AUTH_LDAP_BIND_CREDENTIAL}`
	AUTH_LDAP_JAAS_SECURITY_DOMAIN	The JMX ObjectName of the JaasSecurityDomain used to decrypt the password.	`\${AUTH_LDAP_JAAS_SECURITY_DOMAIN}`
	AUTH_LDAP_BASE_CTX_DN	LDAP Base DN of the top-level context to begin the user search.	`\${AUTH_LDAP_BASE_CTX_DN}`
	AUTH_LDAP_BASE_FILTER	LDAP search filter used to locate the context of the user to authenticate. The input username or userDN obtained from the login module callback is substituted into the filter anywhere a {0} expression is used. A common example for the search filter is (uid={0}).	`\${AUTH_LDAP_BASE_FILTER}`
	AUTH_LDAP_SEARCH_SCOPE	The search scope to use.	`\${AUTH_LDAP_SEARCH_SCOPE}`
	AUTH_LDAP_SEARCH_TIME_LIMIT	The timeout in milliseconds for user or role searches.	`\${AUTH_LDAP_SEARCH_TIME_LIMIT}`

Deployment	Variable name	Description	Example value
	AUTH_LDAP_DISTINGUISHED_NAME_ATTRIBUTE	The name of the attribute in the user entry that contains the DN of the user. This may be necessary if the DN of the user itself contains special characters, backslash for example, that prevent correct user mapping. If the attribute does not exist, the entry's DN is used.	`\${AUTH_LDAP_DISTINGUISHED_NAME_ATTRIBUTE}`
	AUTH_LDAP_PARSE_USERNAME	A flag indicating if the DN is to be parsed for the user name. If set to true, the DN is parsed for the user name. If set to false the DN is not parsed for the user name. This option is used together with <code>usernameBeginString</code> and <code>usernameEndString</code> .	`\${AUTH_LDAP_PARSE_USERNAME}`
	AUTH_LDAP_USERNAME_BEGIN_STRING	Defines the String which is to be removed from the start of the DN to reveal the user name. This option is used together with <code>usernameEndString</code> and only taken into account if <code>parseUsername</code> is set to true.	`\${AUTH_LDAP_USERNAME_BEGIN_STRING}`
	AUTH_LDAP_USERNAME_END_STRING	Defines the String which is to be removed from the end of the DN to reveal the user name. This option is used together with <code>usernameEndString</code> and only taken into account if <code>parseUsername</code> is set to true.	`\${AUTH_LDAP_USERNAME_END_STRING}`

Deployment	Variable name	Description	Example value
	AUTH_LDAP_ROLE_ATTRIBUTE_ID	Name of the attribute containing the user roles.	`\${AUTH_LDAP_ROLE_ATTRIBUTE_ID}`
	AUTH_LDAP_ROLE_S_CTX_DN	The fixed DN of the context to search for user roles. This is not the DN where the actual roles are, but the DN where the objects containing the user roles are. For example, in a Microsoft Active Directory server, this is the DN where the user account is.	`\${AUTH_LDAP_ROLE_S_CTX_DN}`
	AUTH_LDAP_ROLE_FILTER	A search filter used to locate the roles associated with the authenticated user. The input username or userDN obtained from the login module callback is substituted into the filter anywhere a <code>{0}</code> expression is used. The authenticated userDN is substituted into the filter anywhere a <code>{1}</code> is used. An example search filter that matches on the input username is <code>(member={0})</code> . An alternative that matches on the authenticated userDN is <code>(member={1})</code> .	`\${AUTH_LDAP_ROLE_FILTER}`
	AUTH_LDAP_ROLE_RECURSION	The number of levels of recursion the role search will go below a matching context. Disable recursion by setting this to 0.	`\${AUTH_LDAP_ROLE_RECURSION}`
	AUTH_LDAP_DEFAULT_ROLE	A role included for all authenticated users	`\${AUTH_LDAP_DEFAULT_ROLE}`

Deployment	Variable name	Description	Example value
	AUTH_LDAP_ROLE_NAME_ATTRIBUTE_ID	Name of the attribute within the roleCtxDN context which contains the role name. If the roleAttributesDN property is set to true, this property is used to find the role object's name attribute.	\${AUTH_LDAP_ROLE_NAME_ATTRIBUTE_ID}
	AUTH_LDAP_PARSE_ROLE_NAME_FROM_DN	A flag indicating if the DN returned by a query contains the roleNameAttributeID. If set to true, the DN is checked for the roleNameAttributeID. If set to false, the DN is not checked for the roleNameAttributeID. This flag can improve the performance of LDAP queries.	\${AUTH_LDAP_PARSE_ROLE_NAME_FROM_DN}
	AUTH_LDAP_ROLE_ATTRIBUTE_IS_DN	Whether or not the roleAttributeID contains the fully-qualified DN of a role object. If false, the role name is taken from the value of the roleNameAttributeID attribute of the context name. Certain directory schemas, such as Microsoft Active Directory, require this attribute to be set to true.	\${AUTH_LDAP_ROLE_ATTRIBUTE_IS_DN}

Deployment	Variable name	Description	Example value
	AUTH_LDAP_REFERRAL_USER_ATTRIBUTE_ID_TO_CHECK	If you are not using referrals, you can ignore this option. When using referrals, this option denotes the attribute name which contains users defined for a certain role, for example member, if the role object is inside the referral. Users are checked against the content of this attribute name. If this option is not set, the check will always fail, so role objects cannot be stored in a referral tree.	\${AUTH_LDAP_REFERRAL_USER_ATTRIBUTE_ID_TO_CHECK}
	AUTH_ROLE_MAPPER_ROLES_PROPERTIES	When present, the RoleMapping Login Module will be configured to use the provided file. This parameter defines the fully-qualified file path and name of a properties file or resource which maps roles to replacement roles. The format is original_role=role1,role2,role3	\${AUTH_ROLE_MAPPER_ROLES_PROPERTIES}
	AUTH_ROLE_MAPPER_REPLACE_ROLE	Whether to add to the current roles, or replace the current roles with the mapped ones. Replaces if set to true.	\${AUTH_ROLE_MAPPER_REPLACE_ROLE}
\${APPLICATION_NAME}-kieserver	WORKBENCH_SERVICE_NAME	–	\${APPLICATION_NAME}-rhpamcentrmon
	KIE_ADMIN_USER	Admin user name	Set according to the credentials secret
	KIE_ADMIN_PWD	Admin user password	Set according to the credentials secret

Deployment	Variable name	Description	Example value
	KIE_SERVER_MODE	The KIE Server mode. Valid values are 'DEVELOPMENT' or 'PRODUCTION'. In production mode, you can not deploy SNAPSHOT versions of artifacts on the KIE server and can not change the version of an artifact in an existing container. (Sets the org.kie.server.mode system property).	`\${KIE_SERVER_MODE}`
	KIE_MBEANS	KIE server mbeans enabled/disabled (Sets the kie.mbeans and kie.scanner.mbeans system properties)	`\${KIE_MBEANS}`
	DROOLS_SERVER_FILTER_CLASSES	KIE server class filtering. (Sets the org.drools.server.filter.classes system property)	`\${DROOLS_SERVER_FILTER_CLASSES}`
	PROMETHEUS_SERVER_EXT_DISABLED	If set to false, the prometheus server extension will be enabled. (Sets the org.kie.prometheus.server.ext.disabled system property)	`\${PROMETHEUS_SERVER_EXT_DISABLED}`
	KIE_SERVER_BYPASS_AUTH_USER	Allows the KIE server to bypass the authenticated user for task-related operations, for example, queries. (Sets the org.kie.server.bypass.auth.user system property)	`\${KIE_SERVER_BYPASS_AUTH_USER}`
	KIE_SERVER_ID	–	–
	KIE_SERVER_ROUTE_NAME	–	`\${APPLICATION_NAME}-kieserver`
	KIE_SERVER_STARTUP_STRATEGY	–	OpenShiftStartupStrategy

Deployment	Variable name	Description	Example value
	MAVEN_MIRROR_URL	Maven mirror that the KIE server must use. If you configure a mirror, this mirror must contain all artifacts that are required for deploying your services.	`\${MAVEN_MIRROR_URL}`
	MAVEN_MIRROR_OF	Maven mirror configuration for KIE server.	`\${MAVEN_MIRROR_OF}`
	MAVEN_REPOS	–	RHPAMCENTR,EXTERNAL
	RHPAMCENTR_MAVEN_REPO_ID	–	repo-rhpamcentr
	RHPAMCENTR_MAVEN_REPO_SERVICE	The Service name for the optional Business Central, where it can be reached, to allow service lookups (for example, maven repo usage), if required.	`\${BUSINESS_CENTRAL_SERVICE}`
	RHPAMCENTR_MAVEN_REPO_PATH	–	/maven2/
	RHPAMCENTR_MAVEN_REPO_USERNAME	–	Set according to the credentials secret
	RHPAMCENTR_MAVEN_REPO_PASSWORD	–	Set according to the credentials secret

Deployment	Variable name	Description	Example value
	EXTERNAL_MAVEN_REPO_ID	The id to use for the maven repository. If set, it can be excluded from the optionally configured mirror by adding it to MAVEN_MIRROR_OF. For example: external:*,!repo-rhpamcentr,!repo-custom. If MAVEN_MIRROR_URL is set but MAVEN_MIRROR_ID is not set, an id will be generated randomly, but won't be usable in MAVEN_MIRROR_OF.	`\${MAVEN_REPO_ID}`
	EXTERNAL_MAVEN_REPO_URL	Fully qualified URL to a Maven repository or service.	`\${MAVEN_REPO_URL}`
	EXTERNAL_MAVEN_REPO_USERNAME	User name for accessing the Maven repository, if required.	`\${MAVEN_REPO_USERNAME}`
	EXTERNAL_MAVEN_REPO_PASSWORD	Password to access the Maven repository, if required.	`\${MAVEN_REPO_PASSWORD}`
	KIE_SERVER_PERSISTENCE_DS	KIE server persistence datasource. (Sets the org.kie.server.persistence.ds system property)	`\${KIE_SERVER_PERSISTENCE_DS}`
	DATASOURCES	–	RHPAM
	RHPAM_JNDI	KIE server persistence datasource. (Sets the org.kie.server.persistence.ds system property)	`\${KIE_SERVER_PERSISTENCE_DS}`
	RHPAM_JTA	–	true
	RHPAM_DATABASE	KIE server PostgreSQL database name.	`\${KIE_SERVER_POSTGRES_DB}`
	RHPAM_DRIVER	–	postgresql

Deployment	Variable name	Description	Example value
	KIE_SERVER_PERSISTENCE_DIALECT	KIE server PostgreSQL Hibernate dialect.	`\${KIE_SERVER_POSTGRESQL_DIALECT}`
	RHPAM_USERNAME	KIE server PostgreSQL database user name.	`\${KIE_SERVER_POSTGRESQL_USER}`
	RHPAM_PASSWORD	KIE server PostgreSQL database password.	`\${KIE_SERVER_POSTGRESQL_PWD}`
	RHPAM_SERVICE_HOST	–	`\${APPLICATION_NAME}-postgresql`
	RHPAM_SERVICE_PORT	–	5432
	TIMER_SERVICE_DATA_STORE_REFRESH_INTERVAL	Sets refresh-interval for the EJB timer service database-data-store.	`\${TIMER_SERVICE_DATA_STORE_REFRESH_INTERVAL}`
	HTTPS_KEYSTORE_DIR	–	/etc/kieserver-secret-volume`
	HTTPS_KEYSTORE	The name of the keystore file within the secret.	`\${KIE_SERVER_HTTPS_KEYSTORE}`
	HTTPS_NAME	The name associated with the server certificate.	`\${KIE_SERVER_HTTPS_NAME}`
	HTTPS_PASSWORD	The password for the keystore and certificate.	`\${KIE_SERVER_HTTPS_PASSWORD}`
	JGROUPS_PING_PROTOCOL	–	openshift.DNS_PING
	OPENSIFT_DNS_PING_SERVICE_NAME	–	`\${APPLICATION_NAME}-kieserver-ping`
	OPENSIFT_DNS_PING_SERVICE_PORT	–	8888
	SSO_URL	RH-SSO URL.	`\${SSO_URL}`

Deployment	Variable name	Description	Example value
	SSO_OPENIDCONNECT_DEPLOYMENTS	–	ROOT.war
	SSO_REALM	RH-SSO Realm name.	\${SSO_REALM}
	SSO_SECRET	KIE Server RH-SSO Client Secret.	\${KIE_SERVER_SSO_SECRET}
	SSO_CLIENT	KIE Server RH-SSO Client name.	\${KIE_SERVER_SSO_CLIENT}
	SSO_USERNAME	RH-SSO Realm admin user name for creating the Client if it doesn't exist.	\${SSO_USERNAME}
	SSO_PASSWORD	RH-SSO Realm Admin Password used to create the Client.	\${SSO_PASSWORD}
	SSO_DISABLE_SSL_CERTIFICATE_VALIDATION	RH-SSO Disable SSL Certificate Validation.	\${SSO_DISABLE_SSL_CERTIFICATE_VALIDATION}
	SSO_PRINCIPAL_ATTRIBUTE	RH-SSO Principal Attribute to use as user name.	\${SSO_PRINCIPAL_ATTRIBUTE}
	HOSTNAME_HTTP	Custom hostname for http service route. Leave blank for default hostname, e.g.: insecure-<application-name>-kieserver-<project>.<default-domain-suffix>	\${KIE_SERVER_HOSTNAME_HTTP}
	HOSTNAME_HTTPS	Custom hostname for https service route. Leave blank for default hostname, e.g.: <application-name>-kieserver-<project>.<default-domain-suffix>	\${KIE_SERVER_HOSTNAME_HTTPS}

Deployment	Variable name	Description	Example value
	AUTH_LDAP_URL	LDAP Endpoint to connect for authentication.	`\${AUTH_LDAP_URL}`
	AUTH_LDAP_BIND_DN	Bind DN used for authentication.	`\${AUTH_LDAP_BIND_DN}`
	AUTH_LDAP_BIND_CREDENTIAL	LDAP Credentials used for authentication.	`\${AUTH_LDAP_BIND_CREDENTIAL}`
	AUTH_LDAP_JAAS_SECURITY_DOMAIN	The JMX ObjectName of the JaasSecurityDomain used to decrypt the password.	`\${AUTH_LDAP_JAAS_SECURITY_DOMAIN}`
	AUTH_LDAP_BASE_CTX_DN	LDAP Base DN of the top-level context to begin the user search.	`\${AUTH_LDAP_BASE_CTX_DN}`
	AUTH_LDAP_BASE_FILTER	LDAP search filter used to locate the context of the user to authenticate. The input username or userDN obtained from the login module callback is substituted into the filter anywhere a {0} expression is used. A common example for the search filter is (uid={0}).	`\${AUTH_LDAP_BASE_FILTER}`
	AUTH_LDAP_SEARCH_SCOPE	The search scope to use.	`\${AUTH_LDAP_SEARCH_SCOPE}`
	AUTH_LDAP_SEARCH_TIME_LIMIT	The timeout in milliseconds for user or role searches.	`\${AUTH_LDAP_SEARCH_TIME_LIMIT}`

Deployment	Variable name	Description	Example value
	AUTH_LDAP_DISTINGUISHED_NAME_ATTRIBUTE	The name of the attribute in the user entry that contains the DN of the user. This may be necessary if the DN of the user itself contains special characters, backslash for example, that prevent correct user mapping. If the attribute does not exist, the entry's DN is used.	\${AUTH_LDAP_DISTINGUISHED_NAME_ATTRIBUTE}
	AUTH_LDAP_PARSE_USERNAME	A flag indicating if the DN is to be parsed for the user name. If set to true, the DN is parsed for the user name. If set to false the DN is not parsed for the user name. This option is used together with <code>usernameBeginString</code> and <code>usernameEndString</code> .	\${AUTH_LDAP_PARSE_USERNAME}
	AUTH_LDAP_USERNAME_BEGIN_STRING	Defines the String which is to be removed from the start of the DN to reveal the user name. This option is used together with <code>usernameEndString</code> and only taken into account if <code>parseUsername</code> is set to true.	\${AUTH_LDAP_USERNAME_BEGIN_STRING}
	AUTH_LDAP_USERNAME_END_STRING	Defines the String which is to be removed from the end of the DN to reveal the user name. This option is used together with <code>usernameEndString</code> and only taken into account if <code>parseUsername</code> is set to true.	\${AUTH_LDAP_USERNAME_END_STRING}

Deployment	Variable name	Description	Example value
	AUTH_LDAP_ROLE_ATTRIBUTE_ID	Name of the attribute containing the user roles.	`\${AUTH_LDAP_ROLE_ATTRIBUTE_ID}`
	AUTH_LDAP_ROLE_S_CTX_DN	The fixed DN of the context to search for user roles. This is not the DN where the actual roles are, but the DN where the objects containing the user roles are. For example, in a Microsoft Active Directory server, this is the DN where the user account is.	`\${AUTH_LDAP_ROLE_S_CTX_DN}`
	AUTH_LDAP_ROLE_FILTER	A search filter used to locate the roles associated with the authenticated user. The input username or userDN obtained from the login module callback is substituted into the filter anywhere a <code>{0}</code> expression is used. The authenticated userDN is substituted into the filter anywhere a <code>{1}</code> is used. An example search filter that matches on the input username is <code>(member={0})</code> . An alternative that matches on the authenticated userDN is <code>(member={1})</code> .	`\${AUTH_LDAP_ROLE_FILTER}`
	AUTH_LDAP_ROLE_RECURSION	The number of levels of recursion the role search will go below a matching context. Disable recursion by setting this to 0.	`\${AUTH_LDAP_ROLE_RECURSION}`
	AUTH_LDAP_DEFAULT_ROLE	A role included for all authenticated users	`\${AUTH_LDAP_DEFAULT_ROLE}`

Deployment	Variable name	Description	Example value
	AUTH_LDAP_ROLE_NAME_ATTRIBUTE_ID	Name of the attribute within the roleCtxDN context which contains the role name. If the roleAttributesDN property is set to true, this property is used to find the role object's name attribute.	\${AUTH_LDAP_ROLE_NAME_ATTRIBUTE_ID}
	AUTH_LDAP_PARSE_ROLE_NAME_FROM_DN	A flag indicating if the DN returned by a query contains the roleNameAttributeID. If set to true, the DN is checked for the roleNameAttributeID. If set to false, the DN is not checked for the roleNameAttributeID. This flag can improve the performance of LDAP queries.	\${AUTH_LDAP_PARSE_ROLE_NAME_FROM_DN}
	AUTH_LDAP_ROLE_ATTRIBUTE_IS_DN	Whether or not the roleAttributeID contains the fully-qualified DN of a role object. If false, the role name is taken from the value of the roleNameAttributeID attribute of the context name. Certain directory schemas, such as Microsoft Active Directory, require this attribute to be set to true.	\${AUTH_LDAP_ROLE_ATTRIBUTE_IS_DN}

Deployment	Variable name	Description	Example value
	AUTH_LDAP_REFERRAL_USER_ATTRIBUTE_ID_TO_CHECK	If you are not using referrals, you can ignore this option. When using referrals, this option denotes the attribute name which contains users defined for a certain role, for example member, if the role object is inside the referral. Users are checked against the content of this attribute name. If this option is not set, the check will always fail, so role objects cannot be stored in a referral tree.	\${AUTH_LDAP_REFERRAL_USER_ATTRIBUTE_ID_TO_CHECK}
	AUTH_ROLE_MAPPER_ROLES_PROPERTIES	When present, the RoleMapping Login Module will be configured to use the provided file. This parameter defines the fully-qualified file path and name of a properties file or resource which maps roles to replacement roles. The format is original_role=role1,role2,role3	\${AUTH_ROLE_MAPPER_ROLES_PROPERTIES}
	AUTH_ROLE_MAPPER_REPLACE_ROLE	Whether to add to the current roles, or replace the current roles with the mapped ones. Replaces if set to true.	\${AUTH_ROLE_MAPPER_REPLACE_ROLE}
\${APPLICATION_NAME}-postgresql	POSTGRESQL_USER	KIE server PostgreSQL database user name.	\${KIE_SERVER_POSTGRESQL_USER}
	POSTGRESQL_PASSWORD	KIE server PostgreSQL database password.	\${KIE_SERVER_POSTGRESQL_PWD}
	POSTGRESQL_DATABASE	KIE server PostgreSQL database name.	\${KIE_SERVER_POSTGRESQL_DB}

Deployment	Variable name	Description	Example value
	POSTGRESQL_MAX_PREPARED_TRANSACTIONS	Allows the PostgreSQL to handle XA transactions.	`\${POSTGRESQL_MAX_PREPARED_TRANSACTIONS}`

5.1.2.3.3.7. Volumes

Deployment	Name	mountPath	Purpose	readOnly
`\${APPLICATION_NAME}`-rhpamcentrmon	businesscentral-keystore-volume	/etc/businesscentral-secret-volume	ssl certs	True
`\${APPLICATION_NAME}`-kieserver	kieserver-keystore-volume	/etc/kieserver-secret-volume	ssl certs	True
`\${APPLICATION_NAME}`-postgresql	`\${APPLICATION_NAME}`-postgresql-pvol	/var/lib/pgsql/data	postgresql	false

5.1.2.4. External Dependencies

5.1.2.4.1. Volume Claims

A **PersistentVolume** object is a storage resource in an OpenShift cluster. Storage is provisioned by an administrator by creating **PersistentVolume** objects from sources such as GCE Persistent Disks, AWS Elastic Block Stores (EBS), and NFS mounts. See the [OpenShift documentation](#) for more information.

Name	Access Mode
`\${APPLICATION_NAME}`-postgresql-claim	ReadWriteOnce
`\${APPLICATION_NAME}`-rhpamcentr-claim	ReadWriteMany

5.1.2.4.2. Secrets

This template requires the following secrets to be installed for the application to run.

businesscentral-app-secret kieserver-app-secret

5.2. OPENSIFT USAGE QUICK REFERENCE

To deploy, monitor, manage, and undeploy Red Hat Process Automation Manager templates on Red Hat OpenShift Container Platform, you can use the OpenShift Web console or the **oc** command.

For instructions about using the Web console, see [Create and build an image using the Web console](#).

For detailed instructions about using the **oc** command, see [CLI Reference](#). The following commands are likely to be required:

- To create a project, use the following command:

```
$ oc new-project <project-name>
```

For more information, see [Creating a project using the CLI](#).

- To deploy a template (create an application from a template), use the following command:

```
$ oc new-app -f <template-name> -p <parameter>=<value> -p <parameter>=<value> ...
```

For more information, see [Creating an application using the CLI](#).

- To view a list of the active pods in the project, use the following command:

```
$ oc get pods
```

- To view the current status of a pod, including information whether or not the pod deployment has completed and it is now in a running state, use the following command:

```
$ oc describe pod <pod-name>
```

You can also use the **oc describe** command to view the current status of other objects. For more information, see [Application modification operations](#).

- To view the logs for a pod, use the following command:

```
$ oc logs <pod-name>
```

- To view deployment logs, look up a **DeploymentConfig** name in the template reference and enter the following command:

```
$ oc logs -f dc/<deployment-config-name>
```

For more information, see [Viewing deployment logs](#).

- To view build logs, look up a **BuildConfig** name in the template reference and enter the command:

```
$ oc logs -f bc/<build-config-name>
```

For more information, see [Accessing build logs](#).

- To scale a pod in the application, look up a **DeploymentConfig** name in the template reference and enter the command:

```
$ oc scale dc/<deployment-config-name> --replicas=<number>
```

For more information, see [Manual scaling](#).

- To undeploy the application, you can delete the project by using the command:

█ \$ oc delete project <project-name>

Alternatively, you can use the **oc delete** command to remove any part of the application, such as a pod or replication controller. For details, see [Application modification operations](#).

APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Friday, June 25, 2021.