Red Hat Process Automation Manager 7.6

Deploying a Red Hat Process Automation Manager environment on Red Hat OpenShift Container Platform using Operators

Last Updated: 2021-07-15

Red Hat Process Automation Manager 7.6 Deploying a Red Hat Process Automation Manager environment on Red Hat OpenShift Container Platform using Operators

Red Hat Customer Content Services
brms-docs@redhat.com

Legal Notice

Abstract

This document describes how to deploy a Red Hat Process Automation Manager 7.6 environment on Red Hat OpenShift Container Platform using Operators.

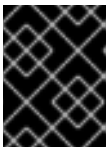
Table of Contents

PREFACE

As a system engineer, you can deploy a Red Hat Process Automation Manager environment on Red Hat OpenShift Container Platform to provide an infrastructure to develop or execute processes and other business assets. You can use OpenShift Operators to deploy the environment defined in a structured YAML file and to maintain and modify this environment as necessary.

Prerequisites

- A Red Hat OpenShift Container Platform environment is available. The Operator is supported on Red Hat OpenShift Container Platform version 4.1 and 4.2.
- At least four gigabytes of memory are available in the OpenShift environment.
- The OpenShift project for the deployment is created.
- You are logged in to the project using the OpenShift 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:
    - Each deployed replicated set of Process Server pods, by default, requires one 1Gi PV for the database. You can change the database PV size. You can deploy multiple immutable servers; each requires a separate database PV. This requirement does not apply if you use an external database server.
    - By default, Business Central requires one 1Gi PV. You can change the PV size for Business Central persistent storage.
    - Business Central Monitoring requires one 64Mi PV.
    - Smart Router requires one 64Mi PV.
- If you intend to scale any of the Business Central or Business Central Monitoring pods, 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.



IMPORTANT

ReadWriteMany mode is not supported on OpenShift Online and OpenShift Dedicated.

CHAPTER 1. OVERVIEW OF RED HAT PROCESS AUTOMATION MANAGER ON RED HAT OPENSHIFT 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:

- Process Server, also known as *Execution Server* or *KIE 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 Process 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, Process Server can use an H2 database; in this case, you cannot scale the pod.

  You can scale up a Process 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 Process 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 Process 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 Process 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 Process 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 Process Servers and other components that interact with them. When your environment includes many services running on different Process 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 Process Server that can process a particular request.

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

CHAPTER 2. PREPARING TO DEPLOY RED HAT PROCESS AUTOMATION MANAGER IN YOUR OPENSHIFT 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 YOUR ENVIRONMENT IS AUTHENTICATED TO THE RED HAT REGISTRY

To deploy Red Hat Process Automation Manager components of Red Hat OpenShift Container Platform, you must ensure that OpenShift can download the correct images from the Red Hat registry.

OpenShift must be configured to authenticate with the Red Hat registry using your service account user name and password. This configuration is specific for a namespace, and if operators work, the configuration is already completed for the **openshift** namespace.

However, if the image streams for Red Hat Process Automation Manager are not found in the **openshift** namespace or if the operator is configured to update Red Hat Process Automation Manager to a new version automatically, the operator needs to download images into the namespace of your project. You must complete the authentication configuration for this namespace.

Procedure

1. Ensure you are logged in to OpenShift with the **oc** command and that your project is active.
2. Complete the steps documented in Registry Service Accounts for Shared Environments . You must log in to Red Hat Customer Portal to access the document and to complete the steps to create a registry service account.
3. Select the **OpenShift Secret** tab and click the link under **Download secret** to download the YAML secret file.
4. View the downloaded file and note the name that is listed in the **name:** entry.
5. Run 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.

2.2. CREATING THE SECRETS FOR PROCESS SERVER

OpenShift uses objects called *secrets* to hold sensitive information such as passwords or keystores. For more information about OpenShift secrets, see What is a secret in the OpenShift documentation.

In order to provide HTTPS access, Process Server uses an SSL certificate. The deployment can create a sample secret automatically. However, in production environments you must create an SSL certificate for Process 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 Process 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 Process 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
```

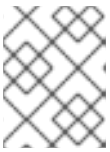
2.3. CREATING THE SECRETS FOR BUSINESS CENTRAL

In order to provide HTTPS access, Business Central uses an SSL certificate. The deployment can create a sample secret automatically. However, in production environments you must create an SSL certificate for Business Central and provide it to your OpenShift environment as a secret.

Do not use the same certificate and keystore for Business Central and Process 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 SECRETS FOR THE AMQ BROKER CONNECTION

If you want to connect any Process Server to an AMQ broker and to use SSL for the AMQ broker connection, you must create an SSL certificate for the connection 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 the AMQ broker connection. 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 the AMQ broker connection.

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 **broker-app-secret** from the new keystore file:

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

2.5. CREATING THE SECRETS FOR SMART ROUTER

In order to provide HTTPS access, Smart Router uses an SSL certificate. The deployment can create a sample secret automatically. However, in production environments you must create an SSL certificate for Smart Router and provide it to your OpenShift environment as a secret.

Do not use the same certificate and keystore for Smart Router as the ones used for Process Server or Business Central.

Procedure

1. Generate an SSL keystore with a private and public key for SSL encryption for Smart Router. 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 Smart Router.

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 **smartrouter-app-secret** from the new keystore file:

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

2.6. PROVISIONING PERSISTENT VOLUMES WITH READWRITEMANY ACCESS MODE USING NFS

If you want to deploy Business Central Monitoring, high-availability Business Central, or any Process Servers that use the H2 database, which is the default setting for a non-high-availability authoring environment, your environment must provision persistent volumes with **ReadWriteMany** access mode.

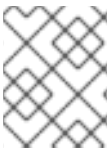
If your configuration requires provisioning persistent volumes with **ReadWriteMany** access mode but your environment does not support such provisioning, use NFS to provision the volumes. Otherwise, skip this procedure.

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 OpenShift Container Platform 4.2 Storage guide.

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. Prepare a Maven release repository to which you can write. The repository must allow read access without authentication. Your OpenShift environment must have 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. 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. Download the latest version of the Offliner tool.

   b. Download the **rhpam-7.6.0-offliner.txt** product deliverable file from the Software Downloads page of the Red Hat Customer Portal.

   c. Enter the following command to use the Offliner tool to download the required artifacts:

   ```
   java -jar offliner-<version>.jar -r https://maven.repository.redhat.com/ga/ -r
   https://repo1.maven.org/maven2/ -d /home/user/temp rhpam-7.6.0-offliner.txt
   ```

   Replace **/home/user/temp** with an empty temporary directory and **<version>** with the version of the Offliner tool that you downloaded. The download can take a significant amount of time.

   d. Upload all artifacts from the temporary directory to the Maven mirror repository that you prepared. You can use the Maven Repository Provisioner utility 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 to upload the artifacts.

CHAPTER 3. DEPLOYMENT AND MANAGEMENT OF A RED HAT PROCESS AUTOMATION MANAGER ENVIRONMENT USING OPENSHIFT OPERATORS

To deploy a Red Hat Process Automation Manager environment, the OpenShift Operator uses a YAML source that describes the environment. Red Hat Process Automation Manager provides an installer that you can use to form the YAML source and deploy the environment.

When the Business Automation operator deploys the environment, it creates a YAML description of the environment, and then ensures that the environment is consistent with the description at all times. You can edit the description to modify the environment.

3.1. SUBSCRIBING TO THE BUSINESS AUTOMATION OPERATOR

To be able to deploy Red Hat Process Automation Manager using operators, you must subscribe to the Business Automation operator in OpenShift.

Procedure

1. Enter your project in the OpenShift Web cluster console.
2. In the OpenShift Web console navigation panel, select **Catalog → OperatorHub** or **Operators → OperatorHub**.
3. Search for **Business Automation**, select it and click **Install**.
4. On the **Create Operator Subscription** page, select your target namespace and approval strategy.
   Optional: Set **Approval strategy** to **Automatic** to enable automatic operator updates. An operator update does not immediately update the product, but is required before you update the product. Configure automatic or manual product updates using the settings in every particular product deployment.
5. Click **Subscribe** to create a subscription.

3.2. DEPLOYING A RED HAT PROCESS AUTOMATION MANAGER ENVIRONMENT USING THE OPERATOR

After you subscribe to the Business Automation operator, you can use the installer wizard to configure and deploy a Red Hat Process Automation Manager environment.

IMPORTANT

In Red Hat Process Automation Manager 7.6, the operator installer wizard is for Technology Preview only. For more information on Red Hat Technology Preview features, see Technology Preview Features Support Scope .

3.2.1. Starting the deployment of a Red Hat Process Automation Manager environment using the Business Automation operator

To start deploying a Red Hat Process Automation Manager environment using the Business Automation operator, access the installer wizard. The installer wizard is deployed when you subscribe to the Operator.

Prerequisites

- You subscribed to the Business Automation operator. For instructions about subscribing to the Operator, see Section 3.1, "Subscribing to the Business Automation operator" .

Procedure

1. In the Red Hat OpenShift Container Platform web cluster console menu, select **Catalog → Installed operators** or **Operators → Installed operators**.
2. Click the name of the operator that contains **businessautomation**. Information about this operator is displayed.
3. Click the **Installer** link, located on the left side of the window in Red Hat OpenShift Container Platform version 4.1 or on the right side of the window in Red Hat OpenShift Container Platform version 4.2 or later.
4. If prompted, log in with your OpenShift credentials.

Result

The **Installation** tab of the wizard is displayed.

3.2.2. Setting the basic configuration of the environment

After you start to deploy a Red Hat Process Automation Manager environment using the Business Automation operator, you must select the type of the environment and set other basic configuration.

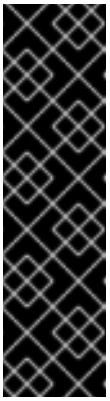
Prerequisites

- You started to deploy a Red Hat Process Automation Manager environment using the Business Automation operator and accessed the installer wizard according to the instructions in Section 3.2.1, "Starting the deployment of a Red Hat Process Automation Manager environment using the Business Automation operator".

Procedure

1. In the **Application Name** field, enter a name for the OpenShift application. This name is used in the default URLs for all components.
2. In the **Environment** list, select the type of environment. This type determines the default configuration; you can modify this configuration as necessary. The following types are available for Red Hat Process Automation Manager:
   - **rhpam-trial**: A trial environment that you can set up quickly and use to evaluate or demonstrate developing and running assets. Includes Business Central and a Process Server. This environment does not use any persistent storage, and any work you do in the environment is not saved.
   - **rhpam-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 Process Server for test execution of the services.

- **rhpam-authoring-ha**: An environment for creating and modifying services using Business Central. It consists of pods that provide Business Central for the authoring work and a Process Server for test execution of the services. This version of the authoring environment supports scaling the Business Central pod to ensure high availability.



IMPORTANT

In Red Hat Process Automation Manager 7.6, high-availability Business Central functionality deployment using the operator is for Technology Preview only. For more information about Red Hat Technology Preview features, see Technology Preview Features Support Scope . For a fully supported high-availabilityAvailability deployment, use the high-availability authoring template on Red Hat OpenShift Container Platform version 3.11. For instructions about deploying this template, see *Deploying a Red Hat Process Automation Manager authoring environment on Red Hat OpenShift Container Platform*.

- **rhpam-production**: An environment for running existing services for staging and production purposes. This environment includes Business Central Monitoring, Smart Router, and two groups of Process 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.

- **rhpam-production-immutable**: An alternate environment for running existing services for staging and production purposes. You can configure one or more Process Server pods that build services from source or pull them from a Maven repository. You can then replicate each pod as necessary.
  You cannot remove any service from the pod or add any new service to the pod. If you want to use another version of a service or to modify the configuration in any other way, deploy a new server image to replace the old one. You can use any container-based integration workflows to manage the pods.

  When configuring this environment, in the **KIE Servers** tab you must customize the Process Server and either click the **Set immutable server configuration** button or set the **KIE_SERVER_CONTAINER_DEPLOYMENT** environment variable. For instructions about configuring the Process Server, see Section 3.2.5, "Setting custom Process Server configuration of the environment".

  Optionally, you can also use the **Console** tab to include Business Central Monitoring in this environment to monitor, stop, and restart the execution of process services. For instructions about configuring Business Central Monitoring, see Section 3.2.4, "Setting the Business Central configuration of the environment".

3. If you want to enable automatic upgrades to new versions, select the **Enable Upgrades** box. If this box is selected, when a new patch version of Red Hat Process Automation Manager 7.6 becomes available, the Operator automatically upgrades your deployment to this version. All services are preserved and normally remain available throughout the upgrade process.
   If you also want to enable the same automatic upgrade process when a new minor version of Red Hat Process Automation Manager 7.x becomes available, select the **Include minor version upgrades** box.

4. If you want to use a custom image registry, under **Custom registry**, enter the URL of the registry in the **Image registry** field. If this registry does not have a properly signed and recognized SSL certificate, select the **Insecure** box.

5. Under **Admin user**, enter the user name and password for the administrative user for Red Hat

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

6. If you want to use a custom version tag for images, complete the following steps:
   a. Click **Next** to access the **Security** tab.
   b. Scroll to the bottom of the window.
   c. Enter the image tag in the **Image tag** field.

Next steps

If you want to deploy the environment with the default configuration, click **Finish** and then click **Deploy** to deploy the environment. Otherwise, continue to set other configuration parameters.

3.2.3. Setting the security configuration of the environment

After you set the basic configuration of a Red Hat Process Automation Manager environment using the Business Automation operator, you can optionally configure authentication (security) settings for the environment.

Prerequisites

- You completed basic configuration of a Red Hat Process Automation Manager environment using the Business Automation operator in the installer wizard according to the instructions in Section 3.2.2, “Setting the basic configuration of the environment”.
- If you want to use RH-SSO or LDAP for authentication, you created users with the correct roles in your authentication system. You must create at least the following users:
  - An administrative user (for example, **adminUser**) with the **kie-server,rest-all,admin** roles
  - A user named **controllerUser** with the **kie-server,rest-all,guest** roles.
  - A user named **executionUser** with the **kie-server,rest-all,guest** roles.
- If you want to use RH-SSO authentication, you created the clients in your RH-SSO system for all components of your environment, specifying the correct URLs. This action ensures maximum control. Alternatively, the deployment can create the clients.

Procedure

1. If the **Installation** tab is open, click **Next** to view the **Security** tab.
2. In the **Authentication mode** list, select one of the following modes:
   - **Internal**: You configure the initial users when deploying the environment. The user can use Business Central to set up other users as necessary.
   - **RH-SSO**: Red Hat Process Automation Manager uses Red Hat Single Sign-On for authentication.
   - **LDAP**: Red Hat Process Automation Manager uses LDAP for authentication
3. Complete the security configuration based on the **Authentication mode** that you selected.

If you selected **Internal**, you can optionally set the **KIE Server password** field. Applications can use the **executionUser** user name with this password to send REST API requests to Process Servers in this environment.

If you selected **RH-SSO**, configure RH-SSO authentication:

a. In the **RH-SSO URL** field, enter the RH-SSO URL.

b. In the **Realm** field, enter the RH-SSO realm name.

c. If you did not create RH-SSO clients for components of your environment enter the credentials of an administrative user for your RH-SSO system in the **SSO admin user** and **SSO admin password** fields.

d. If your RH-SSO system does not have a proper signed SSL certificate, select the **Disable SSL cert validation** box.

e. If you want to change the RH-SSO principal attribute used for the user name, in the **Principal attribute** field enter the name of the new attribute.

f. In the **Controller password** field, enter the password that you configured in RH-SSO for the **controllerUser** user.

g. In the **KIE Server password** field, enter the password that you configured in RH-SSO for the **executionUser** user.

If you selected **LDAP**, configure LDAP authentication:

a. In the **LDAP URL** field, enter the LDAP URL.

b. Configure LDAP parameters that correspond to the settings of the LdapExtended Login module of Red Hat JBoss EAP. For instructions about using these settings, see LdapExtended Login Module.

c. In the **Controller password** field, enter the password that you configured in LDAP for the **controllerUser** user.

d. In the **KIE Server password** field, enter the password that you configured in LDAP for the **executionUser** user.

4. Configure other passwords, if necessary:

- **AMQ password** and **AMQ cluster password** are passwords for interaction with ActiveMQ using the JMS API.
- **Maven password** is the password for **mavenUser**. If your environment includes Business Central, you can use this user to access the built-in Maven repository.
- **Keystore password** is the password for the keystore files used in secrets for HTTPS communication. Set this password if you created secrets according to instructions in Section 2.2, "Creating the secrets for Process Server" or Section 2.3, "Creating the secrets for Business Central".
- **Database password** is the password for database server pods that are a part of the environments.

Next steps

If you want to deploy the environment with the default configuration of all components, click **Finish** and then click **Deploy** to deploy the environment. Otherwise, continue to set configuration parameters for Business Central, Process Servers, and Smart Router.

3.2.4. Setting the Business Central configuration of the environment

After you set the basic and security configuration of a Red Hat Process Automation Manager environment using the Business Automation operator, you can optionally configure settings for the Business Central or Business Central Monitoring component of the environment.

Prerequisites

- You completed basic configuration of a Red Hat Process Automation Manager environment using the Business Automation operator in the installer wizard according to the instructions in Section 3.2.2, "Setting the basic configuration of the environment".
- If you want to use RH-SSO or LDAP for authentication, you completed security configuration according to the instructions in Section 3.2.3, "Setting the security configuration of the environment".

Procedure

1. If the **Installation** or **Security** tab is open, click **Next** until you view the **Console** tab.
2. If you created the secret for Business Central according to the instructions in Section 2.3, "Creating the secrets for Business Central", enter the name of the secret in the **Secret** field.
3. Optionally, enter the number of replicas for Business Central or Business Central monitoring in the **Replicas** field. Do not change this number in a **rhpam-authoring** environment.
4. Optionally, enter requested and maximum CPU and memory limits in the fields under **Resource quotas**.
5. If you selected RH-SSO authentication, configure RH-SSO for Business Central:
    a. Enter the client name in the **Client name** field and the client secret in the **Client secret** field. If a client with this name does not exist, the deployment attempts to create a new client with this name and secret.
    b. If the deployment is to create a new client, enter the HTTP and HTTPS URLs that will be used for accessing the Process Server into the **SSO HTTP URL** and **SSO HTTPS URL** fields. This information is recorded in the client.
6. Optionally, depending on your needs, set environment variables. To set an environment variable, click **Add new Environment variable**, then enter the name and value for the variable in the **Name** and **Value** fields.
    - If you want to use an external Maven repository, set the following variables:
        - **MAVEN_REPO_URL**: The URL for the Maven repository
        - **MAVEN_REPO_ID**: An identifier for the Maven repository, for example, **repo-custom**
        - **MAVEN_REPO_USERNAME**: The user name for the Maven repository
        - **MAVEN_REPO_PASSWORD** The password for the Maven repository

IMPORTANT

In an authoring environment, if you want Business Central to push a project into an external Maven repository, you must configure this repository during deployment and also configure exporting to the repository in every project. For information about exporting Business Central projects to an external Maven repository, see *Packaging and deploying a Red Hat Process Automation Manager project*.

- If your OpenShift environment does not have a connection to the public Internet, configure access to a Maven mirror that you set up according to Section 2.7, "Preparing a Maven mirror repository for offline use". Set the following variables:
  - **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**: 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 your authoring environment uses a built-in Business Central Maven repository, change **MAVEN_MIRROR_OF** to exclude the artifacts in this repository from the mirror: **external:*,!repo-rhpamcentr**.

Next steps

If you want to deploy the environment with the default configuration of Process Servers and Smart Router, click **Finish** and then click **Deploy** to deploy the environment. Otherwise, continue to set configuration parameters for Process Servers and Smart Router.

3.2.5. Setting custom Process Server configuration of the environment

Every environment type in the Business Automation operator includes one or several Process Servers by default.

Optionally, you can set custom configuration for Process Servers. In this case, default Process Servers are not created and only the Process Servers that you configure are deployed.

Prerequisites

- You completed basic configuration of a Red Hat Process Automation Manager environment using the Business Automation operator in the installer wizard according to the instructions in Section 3.2.2, "Setting the basic configuration of the environment" .
- If you want to use RH-SSO or LDAP for authentication, you completed security configuration according to the instructions in Section 3.2.3, "Setting the security configuration of the environment".

Procedure

1. If the **Installation**, **Security**, or **Console** tab is open, click **Next** until you view the **KIE Servers** tab.
2. Click **Add new KIE Server** to add a new Process Server configuration.
3. In the **Id** field, enter an identifier for the Process Server. If the Process Server connects to a Business Central or Business Central Monitoring instance, this identifier determines which server group the server joins.
4. In the **Name** field, enter a name for the Process Server.
5. In the **Deployments** field, enter the number of similar Process Servers that are to be deployed. The installer can deploy several Process Servers with the same configuration. The identifiers and names of the Process Servers are modified automatically and remain unique.
6. If you created the secret for Process Server according to the instructions in Section 2.2, "Creating the secrets for Process Server", enter the name of the secret in the **Keystore secret** field.
7. Optionally, enter the number of replicas for the Process Server in the **Replicas** field.
8. If you want to use a custom image for the Process Server, complete the following additional steps:
   a. Click **Set KIE Server image**
   b. If you want to use a Docker image name and not an OpenShift image stream tag, change the **Kind** value to **DockerImage**.
   c. Enter the name of the image stream in the **Name** field.
   d. If the image stream is not in the **openshift** namespace, enter the namespace in the **Namespace** field.
9. If you want to configure an immutable Process Server using a Source to Image (S2I) build, complete the following additional steps:

IMPORTANT

If you want to configure an immutable Process Server that pulls services from the Maven repository, do not click **Set Immutable server configuration** and do not complete these steps. Instead, set the **KIE_SERVER_CONTAINER_REPLOYMENT** environment variable.

   a. Click **Set Immutable server configuration**
   b. In the **KIE Server container deployment** field, enter the identifying information of the services (KJAR files) that the deployment must extract from the result of a Source to Image (S2I) build. The format is **<containerId>=<groupId>:<artifactId>:<version>** or, if you want to specify an alias name for the container, **<containerId>(<aliasId>)=<groupId>:<artifactId>:<version>**. You can provide two or more KJAR files using the | separator, as illustrated in the following example: **containerId=groupId:artifactId:version|c2(alias2)=g2:a2:v2**.
   c. If your OpenShift environment does not have a connection to the public Internet, enter the

c. If your OpenShift environment does not have a connection to the public Internet, enter the URL of the Maven mirror that you set up according to Section 2.7, "Preparing a Maven mirror repository for offline use" in the **Maven mirror URL** field.

d. In the **Artifact directory** field, enter the path within the project that contains the required binary files (KJAR files and any other necessary files) after a successful Maven build. Normally this directory is the target directory of the build. However, you can provide prebuilt binaries in this directory in the Git repository.

e. If you want to use a custom base Process Server image for the S2I build, click **Set Base build image** and then enter the name of the image stream in the **Name** field. If the image stream is not in the **openshift** namespace, enter the namespace in the **Namespace** field. If you want to use a Docker image name and not an OpenShift image stream tag, change the **Kind** value to **DockerImage**.

f. Click **Set Git source** and enter information in the following fields:

- **S2I Git URI**The URI for the Git repository that contains the source for your services.
- **Reference**: The branch in the Git repository.
- **Context directory**: (Optional) The path to the source within the project downloaded from the Git repository. By default, the root directory of the downloaded project is the source directory.

g. If you want to set a Git Webhook so changes in the Git repository cause an automatic rebuild of the Process Server, click **Add new Webhook**. Select the type of the Webhook from the **Type** list and enter the secret string for the Webhook in the **Secret** field.

10. Optionally, enter requested and maximum CPU and memory limits in the fields under **Resource quotas**. If you are configuring several Process Servers, the limits apply to each server separately.

11. If you selected RH-SSO authentication, configure RH-SSO for the Process Server:

a. Enter the client name in the **Client name** field and the client secret in the **Client secret** field. If a client with this name does not exist, the deployment attempts to create a new client with this name and secret.

b. If the deployment is to create a new client, enter the HTTP and HTTPS URLs that will be used for accessing the Process Server into the **SSO HTTP URL** and **SSO HTTPS URL** fields. This information is recorded in the client.

12. If you want to interact with the Process Server through JMS API using an external AMQ message broker, enable the **Enable JMS Integration** setting. Additional fields for configuring JMS Integration are displayed and you must enter the values as necessary:

- **User name**, **Password**: The user name and password of a standard broker user, if user authentication in the broker is required in your environment.
- **Executor**: Select this setting to disable the JMS executor. The executor is enabled by default.
- **Executor transacted**: Select this setting to enable JMS transactions on the executor queue.
- **Enable signal**: Select this setting to enable signal configuration through JMS.
- **Enable audit** Select this setting to enable audit logging through JMS.

- **Audit transacted**: Select this setting to enable JMS transactions on the audit queue.
- **Queue executor**, **Queue request**, **Queue response**, **Queue signal**, **Queue audit** Custom JNDI names of the queues to use. If you set any of these values, you must also set the **AMQ queues** parameter.
- **AMQ Queues**: AMQ queue names, separated by commas. These queues are automatically created when the broker starts and are accessible as JNDI resources in the JBoss EAP server. If you are using any custom queue names, you must enter the names of all the queues uses by the server in this field.
- **Enable SSL integration**: Select this setting if you want to use an SSL connection to the AMQ broker. In this case you must also provide the name of the secret that you created in Section 2.4, "Creating the secrets for the AMQ broker connection" and the names and passwords of the key store and trust store that you used for the secret.

13. Select the database that the Process Server must use. The following values are available:
    - **mysql**: A MySQL server, created in a separate pod.
    - **postgresql**: A PostgreSQL server, created in a separate pod. Use this setting unless you have a specific reason to use any other setting.
    - **h2**: A built-in **h2** database engine that does not require a separate pod. Do not scale the Process Server pod if you use this setting.
    - **external**: An external database server.

NOTE

In Red Hat Process Automation Manager 7.6, when you deploy an environment using the Business Automation operator, only MySQL and PostgreSQL external database servers are supported.

14. Optionally, in the **Size** field, enter the size of the persistence volume to create for the database server.
15. If you selected an external database server, provide the following information in additional fields:
    a. **Driver**: Enter the database server driver, depending on the server type:
        - **mysql**
        - **postgresql**
        - **mariadb**
        - **mssql**
        - **db2**
        - **oracle**
        - **sybase**
    b. **Dialect**: Enter the Hibernate dialect for the server, depending on the server type:

- **org.hibernate.dialect.MySQL5InnoDBDialect** (used for MySQL and MariaDB)
- **org.hibernate.dialect.PostgreSQL82Dialect**
- **org.hibernate.dialect.SQLServer2012Dialect** (used for MS SQL)
- **org.hibernate.dialect.DB2Dialect**
- **org.hibernate.dialect.Oracle10gDialect**
- **org.hibernate.dialect.SybaseASE157Dialect**

c. **Host**: Enter the host name of the external database server.

d. **Port**: Enter the port number of the external database server.

e. **Jdbc URL**: Enter the JDBC URL for the external database server.

f. **NonXA**: Select this box if you want to configure the data source in non-XA mode.

g. **JNDI name**: Enter the JNDI name that the application uses for the data source.

h. **User name** and **Password**: Enter the user name and password for the external database server.

i. **Background validation**: Optionally, select this box to enable background SQL validation and enter the background validation interval.

j. Optionally, set the minimum and maximum connection pool sizes, valid connection checker class, and exception sorter class for the database server.

16. Optionally, depending on your needs, set environment variables. To set an environment variable, click **Add new Environment variable**, then enter the name and value for the variable in the **Name** and **Value** fields.

- If you want to configure an immutable KIE server that pulls services from the configured Maven repository, enter the following settings:

  i. Set the **KIE_SERVER_CONTAINER_DEPLOYMENT** environment variable. The variable must contain the identifying information of the services (KJAR files) that the deployment must pull from the Maven repository. The format is **<containerId>=<groupId>:<artifactId>:<version>** or, if you want to specify an alias name for the container, **<containerId>(<aliasId>)=<groupId>:<artifactId>:<version>**. You can provide two or more KJAR files using the | separator, as illustrated in the following example: **containerId=groupId:artifactId:version|c2(alias2)=g2:a2:v2**.

  ii. Configure an external Maven repository.

- If you want to configure an external Maven repository, set the following variables:
  - **MAVEN_REPO_URL**: The URL for the Maven repository
  - **MAVEN_REPO_ID**: An identifier for the Maven repository, for example, **repo-custom**
  - **MAVEN_REPO_USERNAME**: The user name for the Maven repository
  - **MAVEN_REPO_PASSWORD**: The password for the Maven repository

- If your OpenShift environment does not have a connection to the public Internet, configure access to a Maven mirror that you set up according to Section 2.7, "Preparing a Maven mirror repository for offline use". Set the following variables:
  - **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. If you configured this Process Server as S2I, you already entered this URL.
  - **MAVEN_MIRROR_OF**: The value that determines which artifacts are to be retrieved from the mirror. If you configured this Process Server as S2I, do not set this value. 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 your authoring environment uses a built-in Business Central Maven repository, change **MAVEN_MIRROR_OF** to exclude the artifacts in this repository from the mirror: **external:*,!repo-rhpamcentr**.
- If you want to configure your Process Server deployment to use Prometheus to collect and store metrics, set the **PROMETHEUS_SERVER_EXT_DISABLED** environment variable to **false**. For instructions about configuring Prometheus metrics collection, see {URL_MANAGING_SETTINGS}#prometheus-monitoring-ocp-proc_execution-server[*Managing and monitoring Process Server*].

Next steps

To configure additional Process Servers, click **Add new KIE Server** again and repeat the procedure for the new server configuration.

If you want to deploy the environment with the default configuration Smart Router, click **Finish** and then click **Deploy** to deploy the environment. Otherwise, continue to set configuration parameters for Smart Router.

3.2.6. Setting custom Smart Router configuration for the environment

By default, an environment of the **rhpam-production** type includes Smart Router. Other environment types do not include Smart Router by default.

You can add a Smart Router to an environment if it is not present. You can also set configuration options for the Smart Router.

Prerequisites

- You completed basic configuration of a Red Hat Process Automation Manager environment using the Business Automation operator in the installer wizard according to the instructions in Section 3.2.2, "Setting the basic configuration of the environment".

Procedure

1. If the **Installation**, **Security**, **Console**, or **KIE Servers** tab is open, click **Next** until you view the **Smart Router** tab.

2. Click **Set Smart Router** to add Smart Router to the environment if one was not present and to set Smart Router configuration.

3. If you created the secret for Smart Router according to the instructions in Section 2.5, "Creating the secrets for Smart Router", enter the name of the secret in the **Secret** field.

4. Optionally, enter the number of replicas for the Smart Router in the **Replicas** field.

5. Optionally, enter requested and maximum CPU and memory limits in the fields under **Resource quotas**.

Next steps

Click **Finish** and then click **Deploy** to deploy the environment.

3.3. MODIFYING AN ENVIRONMENT THAT IS DEPLOYED USING OPERATORS

If an environment is deployed using operators, you cannot modify it using typical OpenShift methods. For example, if you delete a deployment configuration or a service, it is re-created automatically with the same parameters.

To modify the environment, you must modify the YAML description of the environment. You can change common settings such as passwords, add new Process Servers, and scale Process Servers.

Procedure

1. Enter your project in the OpenShift web cluster console.

2. In the OpenShift Web console navigation panel, select **Catalog → Installed operators** or **Operators → Installed operators**.

3. Find the **Business Automation** operator line in the table and click **KieApp** in the line. Information about the environments that you deployed using this operator is displayed.

4. Click the name of a deployed environment.

5. Select the **YAML** tab. A YAML source is displayed.

6. If you want to change common settings, such as passwords, edit the values under **commonConfig:**.

7. If you want to add new Process Servers, add their descriptions at the end of the block under **servers:**, as shown in the following examples:

   - To add two servers named **server-a** and **server-a-2**, add the following lines:

     ```
     - deployments: 2
       name: server-a
     ```

   - To add an immutable Process Server that includes services built from source in an S2I process, add the following lines:

     ```
     - build:
         kieServerContainerDeployment: <deployment>
         gitSource:
     ```

```
uri: <url>
reference: <branch>
contextDir: <directory>
```

Replace the following values:

- **<deployment>**: The identifying information of the decision service (KJAR file) that is built from your source. The format is **<containerId>=<groupId>:<artifactId>:<version>**. You can provide two or more KJAR files using the | separator, for example **containerId=groupId:artifactId:version|c2=g2:a2:v2**. The Maven build process must produce all these files from the source in the Git repository.
- **<url>**: The URL for the Git repository that contains the source for your decision service.
- **<branch>**: The branch in the Git repository.
- **<directory>**: The path to the source within the project downloaded from the Git repository.

8. If you want to scale a Process Server, find the description of the server in the block under **servers:** and add a **replicas:** setting under that description. For example, **replicas: 3** scales the server to three pods.
9. Click **Save** and then wait for a **has been updated** pop-up message.
10. Click **Reload** to view the new YAML description of the environment.

APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Friday, June 25, 2021.