Red Hat Decision Manager 7.5

Installing and configuring Red Hat Decision Manager in a Red Hat JBoss EAP clustered environment

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Abstract

This document describes how to create a Red Hat Decision Manager 7.5 clustered environment on Red Hat JBoss Enterprise Application Platform 7.2.

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PREFACE

As a system engineer, you can create a Red Hat Decision Manager clustered environment to provide high availability and load balancing for your development and runtime environments.

Prerequisites

- You have reviewed the information in *Planning a Red Hat Decision Manager installation* .

CHAPTER 1. RED HAT DECISION MANAGER CLUSTERS

By clustering two or more computers, you have the benefits of high availability, enhanced collaboration, and load balancing. High availability decreases the chance of a loss of data when a single computer fails. When a computer fails, another computer fills the gap by providing a copy of the data that was on the failed computer. When the failed computer comes online again, it resumes its place in the cluster. Load balancing shares the computing load across the nodes of the cluster. Doing this improves the overall performance.

There are several ways that you can cluster Red Hat Decision Manager components. This document describes how to cluster the following scenarios:

- Chapter 2, *Red Hat Decision Manager clusters in a development (authoring) environment*

- Chapter 3, *Decision Server clusters in a runtime environment*

CHAPTER 2. RED HAT DECISION MANAGER CLUSTERS IN A DEVELOPMENT (AUTHORING) ENVIRONMENT

> **NOTE**
>
> Configuration of Business Central for high availability is currently technology preview.

You can configure Red Hat Decision Manager as a clustered development environment to benefit from high availability. With a clustered environment, if a developer is working on **$node1** and that node fails, that developer's work is preserved and visible on any other node of the cluster.

Most development environments consist of Business Central and at least one Decision Server .

To create a Red Hat Decision Manager clustered development environment, you must perform the following tasks:

- Configure Red Hat JBoss EAP 7.2 with Red Hat Data Grid 7.3.1 on a machine.

- Configure AMQ Broker, a Java messaging server (JMS) broker, on a machine.

- Configure an NFS file server on a machine.

- Download Red Hat JBoss EAP 7.2 and Red Hat Decision Manager 7.5, then install them on each machine that is to become a cluster node.

- Configure and start Business Central on each cluster node to start the operation of the cluster.

Red Hat Data Grid is built from the Infinispan open-source software project. It is a distributed highly scalable full-text search and analytics engine. It contains indexing capabilities that enable you to store, search, and analyze high volumes of data quickly and in near-real time. In a Red Hat Decision Manager clustered environment, it enables you to perform complex and efficient searches across cluster nodes.

A JMS broker is a software component that receives messages, stores them locally, and forwards the messages to a recipient. AMQ Broker enables your applications to communicate with any messaging provider. It specifies how components such as message-driven beans, Enterprise JavaBeans, and servlets can send or receive messages.

2.1. INSTALLING AND CONFIGURING RED HAT DATA GRID

To use Red Hat Data Grid for more efficient searching across cluster nodes, install and configure Red Hat Data Grid for the Red Hat Decision Manager clustered environment. Use the following instructions to configure a simplified, non-high availability environment on a separate machine.

For information about Red Hat Data Grid modules for Red Hat JBoss EAP, see Red Hat Data Grid modules for EAP in the *Red Hat Data Grid User Guide* .

> **NOTE**
>
> Do not install Red Hat Data Grid on the same node as Business Central.

Prerequisites

- A Java Virtual Machine (JVM) environment compatible with Java 8.0 or later is installed.

- A backed-up Red Hat JBoss EAP installation version 7.2 or higher is available. The base directory of the Red Hat JBoss EAP installation is referred to as **EAP_HOME**.

- Red Hat Decision Manager is installed and configured.

- Sufficient user permissions to complete the installation are granted.

Procedure

1. Navigate to the Software Downloads page in the Red Hat Customer Portal (login required), and select the product and version from the drop-down options:

   - **Product:** Data Grid

   - **Version:** 7.3

2. Download and unzip the **Red Hat JBoss Data Grid 7.3.0 Server**(**jboss-datagrid-7.3.0-1-server.zip**) installation file to the preferred location on your system.
   The unzipped directory is referred to as **JDG_HOME**.

3. To run Red Hat Data Grid, navigate to **JDG_HOME**/**bin** and enter one of the following commands:

   - On Linux or UNIX-based systems:

     ```
     $ ./standalone.sh -c clustered.xml
     ```

   - On Windows:

     ```
     standalone.bat -c clustered.xml
     ```

2.2. DOWNLOADING AND CONFIGURING AMQ BROKER

AMQ Broker enables your applications to communicate with any messaging provider. It specifies how components such as message-driven beans, Enterprise JavaBeans, and servlets can send or receive messages. Use the following instructions to configure a simplified, non-high availability environment on a separate machine.

To configure AMQ Broker for a high availability Red Hat Decision Manager clustered environment, see *Using AMQ Broker*.

Procedure

1. Navigate to the Software Downloads page in the Red Hat Customer Portal (login required), and select the product and version from the drop-down options:

   - **Product: AMQ Broker**

   - **Version: 7.2.0**

2. Click **Download** next to **Red Hat AMQ Broker 7.2.0**(**amq-broker-7.2.0-bin.zip**).

3. Extract the **amq-broker-7.2.0-bin.zip** file.

4. Change directory to **amq-broker-7.2.0-bin**/**amq-broker-7.2.0**/**bin**.

5. Enter the following command and replace the following placeholders to create the broker and broker user:

   - **<HOST>** is the IP address or host name of the server where you installed AMQ Broker.

   - **<AMQ_USER>** and **<AMQ_PASSWORD>** is a user name and password combination of your choice.

   - **<BROKER_NAME>** is a name for the broker that you are creating.

     ```
     ./artemis create --host <HOST> --user <AMQ_USER> --password <AMQ_PASSWORD>
     --require-login <BROKER_NAME>
     ```

6. To run AMQ Broker, enter the following command in the **amq-broker-7.2.0-bin**/**amq-broker-7.2.0/bin** directory:

   ```
   amq-broker-7.2.0/bin/<BROKER_NAME>/bin/artemis run
   ```

2.3. CONFIGURING AN NFS SERVER

You must deploy and configure an NFS server to provide the file system necessary for a Business Central clustered environment.

You must use NFS version 4.

Procedure

1. Configure a server to export NFS version 4 shares. For instructions about exporting NFS shares on Red Hat Enterprise Linux, see Exporting NFS shares .

2. Create an **/opt/kie/data** share with the options: **rw,sync,no_root_squash**. For example, you can use one of the following lines in the **/etc/exports** file:

   ```
   /opt/kie/data *(rw,sync,no_root_squash)
   /opt/kie/data 192.268.1.0/24(rw,sync,no_root_squash)
   ```

   > **NOTE**
   >
   > You can use another share name instead of '/opt/kie/data'. In this case, you must use this name when configuring all nodes that run Business Central.

2.4. DOWNLOADING AND EXTRACTING RED HAT JBOSS EAP 7.2 AND RED HAT DECISION MANAGER

Download and install Red Hat JBoss EAP 7.2 and Red Hat Decision Manager 7.5 on each node of the cluster.

Procedure

1. Download Red Hat JBoss EAP 7.2 on each node of the cluster:

   a. Navigate to the Software Downloads page in the Red Hat Customer Portal (login required), and select the product and version from the drop-down options:

- Product: Enterprise Application Platform

- Version: 7.2

b. Click **Download** next to **Red Hat JBoss Enterprise Application Platform 7.2.0** (**JBEAP-7.2.0/jboss-eap-7.2.0.zip**).

2. Extract the **jboss-eap-7.2.0.zip** file. In the following steps, *EAP_HOME* is the **jboss-eap-7.2**/**jboss-eap-7.2** directory.

3. Download and apply the latest Red Hat JBoss EAP patch, if available.

4. Download Red Hat Decision Manager on each node of the cluster:

   a. Navigate to the Software Downloads page in the Red Hat Customer Portal, and select the product and version from the drop-down options:

      - Product: Decision Manager

      - Version: 7.5

   b. Download **Red Hat Decision Manager 7.5.1**Business Central Deployable for Red Hat JBoss EAP 7 (**rhdm-7.5.1-decision-central-eap7-deployable.zip**).

5. Extract the **rhdm-7.5.1-decision-central-eap7-deployable.zip** file to a temporary directory. In the following commands this directory is called *TEMP_DIR*.

6. Copy the contents of *TEMP_DIR*/**rhdm-7.5.1-decision-central-eap7-deployable**/**jboss-eap-7.2** to *EAP_HOME*.

7. Download and apply the latest Red Hat Decision Manager patch, if available.

8. Navigate to the *EAP_HOME*/**bin** directory.

9. Create a user with the **admin** role that you will use to log in to Business Central. In the following command, replace **<username>** and **<password>** with the user name and password of your choice.

   ```
   $ ./add-user.sh -a --user <USERNAME>  --password <PASSWORD> --role admin
   ```

   NOTE

   Make sure that the specified user name is not the same as an existing user, role, or group. For example, do not create a user with the user name **admin**.

   The password must have at least eight characters and must contain at least one number and one non-alphanumeric character, but not & (ampersand).

10. Create a user with the **kie-server** role that you will use to log in to Decision Server.

    ```
    $ ./add-user.sh -a --user <USERNAME>  --password <PASSWORD> --role kie-server
    ```

11. Make a note of your user names and passwords.

2.5. CONFIGURING AND RUNNING BUSINESS CENTRAL IN A CLUSTER

After you install Red Hat JBoss EAP and Business Central you can use Red Hat Data Grid and the AMQ Broker to configure the cluster. Complete these steps on each node of the cluster.

> **NOTE**
>
> These steps describe a basic cluster configuration. For more complex configurations, see the *Red Hat JBoss EAP 7.2 Configuration Guide* .

Prerequisites

- Red Hat Data Grid 7.3.1 is installed as described in Section 2.1, "Installing and configuring Red Hat Data Grid".

- AMQ Broker is installed and configured, as described in Section 2.2, "Downloading and configuring AMQ Broker".

- Red Hat JBoss EAP and Red Hat Decision Manager are installed on each node of the cluster as described in Section 2.4, "Downloading and extracting Red Hat JBoss EAP 7.2 and Red Hat Decision Manager".

- An NFS server with a mounted partition is available.

> **NOTE**
>
> To configure an NFS server with a mounted partition, perform the following steps:
>
> 1. Configure the NFS server. For more information, see *How to configure NFS in RHEL 7* and Section 2.3, "Configuring an NFS server" .
>
> 2. To add the shared folder, enter the following command:
>
>    ```
>    # vi /etc/exports /data/shared * (rw,sync,no_root_squash)
>    ```
>
>   Where **/data/shared** is the shared folder, ***** are the IP addresses allowed to connect to the NFS server, and **(rw,sync,no_root_squash)** are the minimum options required for NFS.

Procedure

1. Mount the directory shared over NFS as **/data**. Enter the following commands as the root user:

   ```
   mkdir /data
   mount <NFS_SERVER_IP>:<DATA_SHARE> /data
   ```

   Replace *<NFS_SERVER_IP>* with the IP address or hostname of the NFS server machine. Replace *<DATA_SHARE>* with the share name that you configured (for example, **/opt/kie/data**).

2. Open the ***EAP_HOME*/standalone/configuration/standalone-full.xml** file in a text editor.

3. Edit or add the properties under the **<system-properties>** element and replace the following placeholders:

   - **<AMQ_USER>** and **<AMQ_PASSWORD>** are the credentials that you defined when creating the AMQ Broker.

- **<AMQ_BROKER_IP_ADDRESS>** is the IP address of the AMQ Broker.

- **<INFINISPAN_NODE_IP>** is the IP address where Red Hat Data Grid is installed.

  ```
  <system-properties>
    <property name="appformer-jms-connection-mode" value="REMOTE"/>
    <property name="appformer-jms-username" value="<AMQ_USER>"/>
    <property name="appformer-jms-password" value="<AMQ_USER_PASSWORD>"/>
    <property name="appformer-jms-url"
      value="tcp://<AMQ_BROKER_IP_ADDRESS>:61616?
  ha=true&amp;retryInterval=1000&amp;retryIntervalMultiplier=1.0&amp;reconnectAttempts=
  -1"/>
    <property name="org.appformer.ext.metadata.infinispan.port"
      value="11222"/>
    <property name="org.appformer.ext.metadata.infinispan.host"
      value="<INFINISPAN_NODE_IP>"/>
    <property name="org.appformer.ext.metadata.infinispan.realm"
      value="ApplicationRealm"/>
    <property name="org.appformer.ext.metadata.infinispan.cluster"
      value="kie-cluster"/>
    <property name="org.appformer.ext.metadata.index"
      value="infinispan"/>
    <property name="org.uberfire.nio.git.dir"
      value="/data"/>
    <property name="es.set.netty.runtime.available.processors"
      value="false"/>
  </system-properties>
  ```

4. Optional: If the Red Hat Data Grid deployment requires authentication, edit or add the properties under the **<system-properties>** element and replace the following placeholders:

   - **<SERVER_NAME>** is the server name specified in your Red Hat Data Grid server configuration.

   - **<SASL_QOP>** is the combination of auth, auth-int and auth-conf values for your Red Hat Data Grid server configuration.

     ```
     <property name="org.appformer.ext.metadata.infinispan.server.name"
       value="<SERVER_NAME>"/>
     <property name="org.appformer.ext.metadata.infinispan.sasl.qop"
       value="<SASL_QOP>"/>
     <property name="org.appformer.ext.metadata.infinispan.username"
       value=""/>
     <property name="org.appformer.ext.metadata.infinispan.password"
       value=""/>
     ```

5. Save the **standalone-full.xml** file.

6. To start the cluster, navigate to *EAP_HOME*/**bin** and enter one of the following commands:

   - On Linux or UNIX-based systems:

     ```
     $ ./standalone.sh -c standalone-full.xml
     ```

   - On Windows:

> standalone.bat -c standalone-full.xml

2.6. VERIFYING THE RED HAT DECISION MANAGER CLUSTER

After configuring the cluster for Red Hat Decision Manager, create an asset to verify that the installation is working.

Procedure

1. In a web browser, enter **<node-IP-address>:8080/decision-central**. Replace **<node-IP-address>** with the IP address of a particular node.

2. Enter the **admin** user credentials that you created during installation. The Business Central home page appears.

3. Select **Menu → Design → Projects**.

4. Open the **MySpace** space.

5. Click **Try Samples → Mortgages → OK**. The **Assets** window appears.

6. Click **Add Asset → Data Object**.

7. Enter **MyDataObject** in the Data Object field and click **OK**.

8. Click **Spaces → MySpace → Mortgages** and confirm that **MyDataObject** is in the list of assets.

9. Enter the following URL in a web browser, where **<node_IP_address>** is the address of a different node of the cluster:
   http://<node_IP_address>:8080/decision-central

10. Enter the same credentials that you used to log in to Business Central on the first node, where you created the **MyDataObject** asset.

11. Select **Menu→ Design → Projects**.

12. Open the **MySpace** space.

13. Select the **Mortgages** project.

14. Verify that **MyDataObject** is in the asset list.

15. Delete the **Mortgages** project.

CHAPTER 3. DECISION SERVER CLUSTERS IN A RUNTIME ENVIRONMENT

The primary benefit of clustering a Decision Server runtime environment is load balancing. If activity on one node of the cluster increases, that activity can be shared among the other nodes of the cluster to improve performance.

To create a Decision Server clustered runtime environment, you download and extract Red Hat JBoss EAP 7.2 and Decision Server. Then, you configure Red Hat JBoss EAP 7.2 for a cluster, start the cluster, and install Decision Server on each cluster node.

Optionally, you can then cluster the headless Decision Manager controller.

3.1. DOWNLOADING AND EXTRACTING RED HAT JBOSS EAP 7.2 AND DECISION SERVER

Complete the steps in this section to download and install Red Hat JBoss EAP 7.2 and Decision Server for installation in a clustered environment.

Procedure

1. Download Red Hat JBoss EAP 7.2 on each node of the cluster:

   a. Navigate to the Software Downloads page in the Red Hat Customer Portal (login required) and select the product and version from the drop-down options:

      - **Product: Red Hat JBoss EAP**

      - **Version: 7.2**

   b. Click **Download** next to **Red Hat JBoss Enterprise Application Platform 7.2.0** (**jboss-eap-7.2.0.zip**).

2. Extract the **jboss-eap-7.2.0.zip** file. The **jboss-eap-7.2**/**jboss-eap-7.2** directory is referred to as *EAP_HOME*.

3. Download and apply the latest Red Hat JBoss EAP patch, if available.

4. Download Decision Server:

   a. Navigate to the Software Downloads page in the Red Hat Customer Portal and select the product and version from the drop-down options:

      - **Product: Decision Manager**

      - **Version: 7.5**

   b. Download **Red Hat Decision Manager 7.5.1 Decision Server for All Supported EE8 Containers** (**rhdm-7.5.1-kie-server-ee8.zip**).

5. Extract the **rhdm-7.5.1-kie-server-ee8.zip** archive to a temporary directory. In the following examples this directory is called *TEMP_DIR*.

6. Copy the *TEMP_DIR*/**rhdm-7.5.1-kie-server-ee8**/**rhdm-7.5.1-kie-server-ee8**/**kie-server.war** directory to *EAP_HOME*/**standalone**/**deployments**/.

> **WARNING**
>
> Ensure the names of the Red Hat Decision Manager deployments you copy do not conflict with your existing deployments in the Red Hat JBoss EAP instance.

7. Copy the contents of the *TEMP_DIR*/**rhdm-7.5.1-kie-server-ee8**/**rhdm-7.5.1-kie-server-ee8**/**SecurityPolicy**/ to *EAP_HOME*/**bin**. When asked to overwrite files, click **Replace**.

8. In the *EAP_HOME*/**standalone**/**deployments**/ directory, create an empty file named **kie-server.war.dodeploy**. This file ensures that Decision Server is automatically deployed when the server starts.

9. Download and apply the latest Red Hat Decision Manager patch, if available.

10. Navigate to the *EAP_HOME*/**bin** directory.

11. Create a user with the **kie-server** role that you will use to log in to Decision Server.

    ```
    $ ./add-user.sh -a --user <USERNAME>  --password <PASSWORD> --role kie-server
    ```

12. Make a note of your user names and passwords.

13. To start the cluster, navigate to *EAP_HOME*/**bin** and enter one of the following commands:

    - On Linux or UNIX-based systems:

      ```
      $ ./standalone.sh -c standalone-full.xml
      ```

    - On Windows:

      ```
      standalone.bat -c standalone-full.xml
      ```

3.2. CLUSTERING DECISION SERVERS WITH THE HEADLESS DECISION MANAGER CONTROLLER

The Decision Manager controller is integrated with Business Central. However, if you do not install Business Central, you can install the headless Decision Manager controller and use the REST API or the Decision Server Java Client API to interact with it.

Prerequisites

- A backed-up Red Hat JBoss EAP installation version 7.2 or later is available. The base directory of the Red Hat JBoss EAP installation is referred to as *EAP_HOME*.

- Sufficient user permissions to complete the installation are granted.

- An NFS server with a mounted partition is available.

> **NOTE**
>
> To configure an NFS server with a mounted partition, perform the following steps:
>
> 1. Configure the NFS server. For more information, see *How to configure NFS in RHEL 7*.
>
> 2. To add the shared folder, enter the following command:
>
>    ```
>    # vi /etc/exports
>    /data/shared *(rw,sync,no_root_squash)
>    ```
>
>   Where **/data/shared** is the shared folder, ***** are the IP addresses allowed to connect to the NFS server, and **(rw,sync,no_root_squash)** are the minimum options required for NFS.

Procedure

1. Navigate to the Software Downloads page in the Red Hat Customer Portal (login required), and select the product and version from the drop-down options:

   - **Product: Decision Manager**

   - **Version: 7.5**

2. Download **Red Hat Decision Manager 7.5.1 Add Ons** (the **rhdm-7.5.1-add-ons.zip** file).

3. Unzip the **rhdm-7.5.1-add-ons.zip** file. The **rhdm-7.5-controller-ee7.zip** file is in the unzipped directory.

4. Extract the **rhdm-7.5-controller-ee7** archive to a temporary directory. In the following examples this directory is called *TEMP_DIR*.

5. Copy the *TEMP_DIR*/**rhdm-7.5-controller-ee7**/**controller.war** directory to *EAP_HOME*/**standalone/deployments/**.

   > **WARNING**
   >
   > Ensure that the names of the headless Decision Manager controller deployments you copy do not conflict with your existing deployments in the Red Hat JBoss EAP instance.

6. Copy the contents of the *TEMP_DIR*/**rhdm-7.5-controller-ee7**/**SecurityPolicy/** directory to *EAP_HOME*/**bin**. When asked to overwrite files, select **Yes**.

7. In the *EAP_HOME*/**standalone/deployments/** directory, create an empty file named **controller.war.dodeploy**. This file ensures that the headless Decision Manager controller is automatically deployed when the server starts.

8. Open the *EAP_HOME*/**standalone/configuration/standalone.xml** file in a text editor.

9. Add the following properties to the **<system-properties>** element and replace **<NFS_STORAGE>** with the absolute path to the NFS storage where the template configuration is stored:

```
<system-properties>
 <property name="org.kie.server.controller.templatefile.watcher.enabled" value="true"/>
 <property name="org.kie.server.controller.templatefile" value="<NFS_STORAGE>"/>
</system-properties>
```

Template files contain default configurations for specific deployment scenarios.

If the value of the **org.kie.server.controller.templatefile.watcher.enabled** property is set to true, a separate thread is started to watch for modifications of the template file. The default interval for these checks is 30000 milliseconds and can be further controlled by the **org.kie.server.controller.templatefile.watcher.interval** system property. If the value of this property is set to false, changes to the template file are detected only when the server restarts.

10. To start the headless Decision Manager controller, navigate to *EAP_HOME*/**bin** and enter the following command:

- On Linux or UNIX-based systems:

  ```
  $ ./standalone.sh
  ```

- On Windows:

  ```
  standalone.bat
  ```

CHAPTER 4. ADDITIONAL RESOURCES

- *Installing and configuring Red Hat Decision Manager on Red Hat JBoss EAP 7.2*

- *Planning a Red Hat Decision Manager installation*

- *Deploying a Red Hat Decision Manager immutable server environment on Red Hat OpenShift Container Platform*

- *Deploying a Red Hat Decision Manager authoring or managed server environment on Red Hat OpenShift Container Platform*

- *Deploying a Red Hat Decision Manager environment on Red Hat OpenShift Container Platform using Automation Broker*

- *Deploying a Red Hat Decision Manager environment on Red Hat OpenShift Container Platform using Operators*

APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Thursday, October 31, 2019.