Red Hat Decision Manager 7.2

Installing and configuring Decision Server on Oracle WebLogic Server

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Abstract

This document describes how to configure Oracle WebLogic Server for Decision Server and how to install Decision Server on that Oracle server instance.

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PREFACE

As a system administrator, you can configure your Oracle WebLogic Server for Red Hat Decision Server and install Decision Server on that Oracle server instance.

Prerequisites

- An Oracle WebLogic Server instance version 12.2.1.3.0 or later is installed. For complete installation instructions, see the Oracle WebLogic Server product page .

- You have access to the Oracle WebLogic Server Administration Console, usually at **http://<HOST>:7001/console**.

CHAPTER 1. DECISION SERVER

Decision Server is the server where the rules and other artifacts for Red Hat Decision Manager are stored and run. Decision Server is a standalone built-in component that can be used to instantiate and execute rules through interfaces available for REST, Java Message Service (JMS), or Java client-side applications, and Red Hat Business Optimizer functionality through solvers.

Created as a web deployable WAR file, Decision Server can be deployed on any web container. The current version of the Decision Server is included with default extensions for both Red Hat Decision Manager and Red Hat Process Automation Manager.

Decision Server has a low footprint with minimal memory consumption and therefore can be deployed easily on a cloud instance. Each instance of this server can open and instantiate multiple containers, which enables you to execute multiple rule services in parallel.

Decision Server can be integrated with other application servers, such as Oracle WebLogic Server or IBM WebSphere Application Server, to streamline Red Hat Decision Manager application management.

CHAPTER 2. ORACLE WEBLOGIC SERVER

Oracle WebLogic Server is a Java EE application server that provides a standard set of APIs for creating distributed Java applications that can access a wide variety of services, such as databases, messaging services, and connections to external enterprise systems. User clients access these applications using web browser clients or Java clients.

CHAPTER 3. INSTALLING AND RUNNING ORACLE WEBLOGIC SERVER

Oracle WebLogic Server must be installed and running for you to apply many of the configurations that accommodate Decision Server. This section describes how to install and start Oracle WebLogic Server in a standalone Oracle WebLogic Server domain.

For the most up-to-date and detailed installation instructions, see the Oracle WebLogic Server product page.

> **NOTE**
>
> If you are already running an instance of Oracle WebLogic Server that uses the same listener port as the one to be used by the server you are starting, you must stop the first server before starting the second server.

Procedure

1. Download Oracle WebLogic Server 12.2.1.3.0 or later from the Oracle WebLogic Server Downloads page.

2. Sign in to the target system and verify that a certified JDK already exists on your system. The installer requires a certified JDK. For system requirements, see Oracle Fusion Middleware Systems Requirements and Specifications. To download the JDK, see About JDK Requirements for an Oracle Fusion Middleware Installation.

3. Go to the directory where you downloaded the installation program.

4. Launch the installation program by running **java -jar** from the JDK directory on your system. See the following examples:
   On UNIX-based operating systems:

   ```
   /home/Oracle/jdk/jdk1.8.0_131/bin/java -jar fmw_12.2.1.3.0_wls_generic.jar
   ```

   On Windows operating systems:

   ```
   C:\Program Files\Java\jdk1.8.0_131\bin\java -jar fmw_12.2.1.3.0_wls_generic.jar
   ```

   Be sure to replace the JDK location in these examples with the actual JDK location on your system.

5. Follow the installation wizard prompts to complete the installation.

6. After the installation is complete, navigate to the domain directory in the command terminal, **_WLS_HOME_/user_projects/<DOMAIN_NAME>**. For example:

   ```
   WLS\user_projects\mydomain
   ```

7. Enter one of the following commands to start Oracle WebLogic Server:
   On UNIX-based operating systems:

   ```
   startWebLogic.sh
   ```

On Windows operating systems:

```
startWebLogic.cmd
```

The startup script displays a series of messages, and finally displays a message similar to the following:

```
<Dec 8, 2017 3:50:42 PM PDT> <Notice> <WebLogicServer> <000360> <Server started in RUNNING mode>
```

8. Open the following URL in a web browser:

```
http://<HOST>:<PORT>/console
```

<HOST> is the system name or IP address of the host server.

<PORT> is the address of the port on which the host server is listening for requests (7001 by default).

For example, to start the Administration Console for a local instance of Oracle WebLogic Server running on your system, enter the following URL in a web browser:

```
http://localhost:7001/console/
```

If you started the Administration Console using secure socket layer (SSL), you must add **s** after **http**, as follows: **https://<HOST>:<PORT>/console**

9. When the login page of the WebLogic Administration Console appears, enter your administrative credentials.

CHAPTER 4. CONFIGURING ORACLE WEBLOGIC SERVER FOR DECISION SERVER

Before you deploy Decision Server with Oracle WebLogic Server, you must configure system properties, security settings, JMS requirements, and other properties on Oracle WebLogic Server. These configurations promote an optimal integration with Decision Server.

Prerequisites

- Oracle WebLogic Server is installed and running.

- You are logged in to the WebLogic Administration Console.

4.1. CONFIGURING THE DECISION SERVER GROUP AND USERS

You must assign users to a **kie-server** group in the WebLogic Administration Console to enable the container-managed authentication mechanisms in Oracle WebLogic Server.

Procedure

1. In the WebLogic Administration Console, click **Security Realms**.

2. Choose your desired security realm or click **New** to create a new security realm.

3. Navigate to **Users and Groups** → **Groups** → **New** and create the **kie-server** group.

4. Navigate to **Users** → **New** and create a new user.

5. Enter a user, such as **server-user**, and a password for this new user and click **OK**.
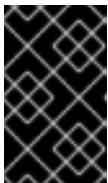
   > **IMPORTANT**
   >
   > Make sure that the selected user name does not conflict with any known title of a role or a group. For example, if there is a role called **kie-server**, then do not create a user with the user name **kie-server**.

6. Click the newly created user, then return to the **Groups** tab.

7. Use the selection tool to move the **kie-server** group from the **Available** field to the **Chosen** field, and click **Save**.

4.2. CONFIGURING JAVA MESSAGE SERVICE (JMS)

The Java Message Service (JMS) is a Java API that Decision Server uses to exchange messages with other application servers such as Oracle WebLogic Server and IBM WebSphere Application Server. You must configure your application server to send and receive JMS messages through Decision Server to ensure proper collaboration between the two servers.

4.2.1. Create a JMS server

You must create a JMS server in order to use JMS.

Procedure

1. In the WebLogic Administration Console, navigate to **Services → Messaging → JMS Servers**.

2. Click **New** to create a new JMS server.

3. Enter a name for your JMS server and click **Next**.

4. Select the target server chosen for the Decision Server deployment.

5. Click **Finish**.

4.2.2. Create a JMS module

You must create a JMS module to store your JMS resources, such as connection factories and queues.

Prerequisite

You have created a JMS server.

Procedure

1. In the WebLogic Administration Console, navigate to **Services → Messaging → JMS Modules**.

2. Click **New** to create a module.

3. Enter a module name and click **Next**.

4. Select the target server chosen for the Decision Server deployment and click **Finish**.

5. Click the newly created module name and then click **Subdeployments**.

6. Click **New** to create a subdeployment for your module.

7. Give your subdeployment a name and click **Next**.

8. Select the check box to choose the previously created JMS server.

9. Click **Finish** to complete the subdeployment configuration.

4.2.3. Create JMS connection factories

To enable messaging with Decision Server, you must create certain JMS connection factories for sending and receiving messages.

Prerequisites

- You have created a JMS server.

- You have created a JMS module.

Procedure

1. In the WebLogic Administration Console, navigate to **Services → Messaging → JMS Modules** to see a list of JMS modules.

2. Select your previously created module and click **New** to create a new JMS resource.

3. Select **Connection Factory** and click **Next**.

4. For each of the following required connection factories, enter the name of the connection factory (for example, **KIE.SERVER.REQUEST**) and the JNDI name (for example, **jms/cf/KIE.SERVER.REQUEST**) and click **Next**. The connection factory automatically selects the servers assigned to the JMS Module as the default.

5. Click **Finish** to add the connection factory, and repeat for each required factory.

4.2.3.1. JMS connection factories for Decision Server

The following are the required Java Message Service (JMS) connection factories that enable JMS messaging with Decision Server:

Table 4.1. Required JMS connection factories for Decision Server

Name	Default value	Used for
KIE.SERVER.REQUEST	**jms/cf/KIE.SERVER.REQUEST**	Sending all requests to Decision Server
KIE.SERVER.RESPONSE	**jms/cf/KIE.SERVER.RESPONSE**	Receiving all responses produced by Decision Server

4.2.4. Create JMS queues

JMS queues are the destination end points for point-to-point messaging. You must create certain JMS queues to enable JMS messaging with Decision Server.

Prerequisites

- You have created a JMS server.

- You have created a JMS module.

Procedure

1. In the WebLogic Administration Console, navigate to **Services → Messaging → JMS Modules** to see the list of JMS modules.

2. Select your previously created module, then click **New** to create a new JMS resource.

3. Select **Queue** and click **Next**.

4. For each of the following required queues, enter the name of the queue (for example, **KIE.SERVER.REQUEST**) and the JNDI name (for example, **jms/KIE.SERVER.REQUEST**) and then click **Next**.

5. Choose the JMS module subdeployment that connects to the JMS server.

6. Click **Finish** to add the queue, and repeat for each required queue.

4.2.4.1. JMS queues for Decision Server

The following are the required Java Message Service (JMS) queues that enable JMS messaging with Decision Server:

Table 4.2. Required JMS queues for Decision Server

Name	Default value	Used for
KIE.SERVER.REQUEST	**jms/KIE.SERVER.REQUEST**	Sending all requests to Decision Server
KIE.SERVER.RESPONSE	**jms/KIE.SERVER.RESPONSE**	Receiving all responses produced by Decision Server

4.3. SETTING SYSTEM PROPERTIES IN ORACLE WEBLOGIC SERVER

Set the system properties listed in this section on your Oracle WebLogic Server before you deploy Decision Server.

Procedure

1. Set the following system property to increase the Java Virtual Machine (JVM) memory size:

   USER_MEM_ARGS=-Xms512m -Xmx1024m

   If you do not increase the JVM memory size, Oracle WebLogic Server freezes or causes deployment errors when deploying Decision Server.

2. Specify the following system properties for Decision Server on the Oracle WebLogic Server instance:

   Table 4.3. System properties for Decision Server

Name	Value	Description
kie.server.jms.queues.response	**jms/queue/KIE.SERVER.RESPONSE**	The JNDI name of JMS queue for responses used by the Decision Server.
org.kie.server.domain	**OracleDefaultLoginConfiguration**	JAAS **LoginContext** domain used to authenticate users when using JMS.
org.jbpm.server.ext.disabled	**true**	Disables Decision Central features, which are not supported in RHDM. If not set, Decision Server will work, but will show error messages during start up.

Name	Value	Description
org.jbpm.ui.server.ext. disabled	**true**	Disables Decision Central features, which are not supported in RHDM. If not set, Decision Server will work, but will show error messages during start up.
org.jbpm.case.server.ext.disabled	**true**	Disables Decision Central features, which are not supported in RHDM. If not set, Decision Server will work, but will show error messages during start up.

3. Set the same property values in the **JAVA_OPTIONS** environment variable:

```
JAVA_OPTIONS="-Dkie.server.jms.queues.response=jms/queue/KIE.SERVER.RESPONSE
 -Dorg.kie.server.domain=OracleDefaultLoginConfiguration
 -Dorg.jbpm.server.ext.disabled=true
 -Dorg.jbpm.ui.server.ext.disabled=true
 -Dorg.jbpm.case.server.ext.disabled=true"
```

4.4. STOPPING AND RESTARTING ORACLE WEBLOGIC SERVER

After you have configured all required system properties in Oracle WebLogic Server, stop and restart the Oracle server to ensure that the configurations are applied.

Procedure

1. In the WebLogic Administration Console, navigate to **Change Center → Lock & Edit**

2. Under **Domain Structure**, click **Environment → Servers → Control**.

3. Select the server that you want to stop and click **Shutdown**.

4. Select **When Work Completes** to gracefully shut down the server or select **Force Shutdown Now** to stop the server immediately without completing ongoing tasks.

5. On the **Server Life Cycle Assistant** pane, click **Yes** to complete the shutdown.

6. After the shutdown is complete, navigate to the domain directory in the command terminal, ***WLS_HOME*/user_projects/<DOMAIN_NAME>**. For example:

```
WLS\user_projects\mydomain
```

7. Enter one of the following commands to restart Oracle WebLogic Server to apply the new configurations:
On UNIX-based operating systems:

> startWebLogic.sh

On Windows operating systems:

> startWebLogic.cmd

8. Open the Administration Console in a web browser (for example, **http://localhost:7001/console/**) and log in with your credentials.

CHAPTER 5. INSTALLING DECISION SERVER WITH ORACLE WEBLOGIC SERVER

After you have configured all required system properties in Oracle WebLogic Server, you can install Decision Server with Oracle WebLogic Server to streamline Red Hat Decision Manager application management.

Prerequisite

An Oracle WebLogic Server instance is configured as described in Chapter 4, *Configuring Oracle WebLogic Server for Decision Server*.

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:** 7.2

2. Download **Red Hat Decision Manager 7.2.0 Decision Server for All Supported EE7 Containers**.

3. Extract the downloaded **rhdm-7.2.0-kie-server-ee7.zip** file to a temporary directory.

4. In the WebLogic Administration Console, navigate to **Deployments** to view all existing applications.

5. Click **Install**.

6. Navigate to the temporary directory where you downloaded and extracted the **rhdm-7.2.0-kie-server-ee7.zip** file, and go to **rhdm-7.2.0-kie-server-ee7/kie-server.war**.

7. Select the **kie-server.war** file and click **Next** to continue.

8. Select **Install this deployment as an application**as the targeting style and click **Next**.

9. Set the application name to **kie-server** and set the security model to **DD Only**. Leave the remaining options as default and click **Next** to continue.

10. In the **Additional Configuration** section, choose **No, I will review the configuration later**and click **Finish**.

5.1. VERIFYING THE DECISION SERVER INSTALLATION ON ORACLE WEBLOGIC SERVER

After you have installed Decision Server on Oracle WebLogic Server, verify that the installation was successful.

Prerequisites

- An Oracle WebLogic Server instance is configured as described in Chapter 4, *Configuring Oracle WebLogic Server for Decision Server*.

- Decision Server is installed as described in Chapter 5, *Installing Decision Server with Oracle WebLogic Server*.

Procedure

1. Enter the Decision Server URL **http://<HOST>:<PORT>/kie-server/services/rest/server** in a web browser.

2. Verify that Decision Server is running.
   If Decision Server is not running, stop and restart the Oracle WebLogic Server instance and try again to access the Decision Server URL.

CHAPTER 6. INSTALLING AND RUNNING THE HEADLESS DECISION MANAGER CONTROLLER WITH ORACLE WEBLOGIC SERVER

To use the Decision Server REST API or Java Client API to interact with Decision Server, install the headless Decision Manager controller with Oracle WebLogic Server. The headless Decision Manager controller manages Decision Server configuration in a centralized way so that you can use the headless Decision Manager controller to create and maintain containers and perform other server-level tasks.

Prerequisites

- The Oracle WebLogic Server instance is configured as described in Chapter 4, *Configuring Oracle WebLogic Server for Decision Server*.

- Decision Server is installed on the Oracle WebLogic Server instance.

- You have sufficient user permissions to complete the installation.

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:** 7.2

2. Download **Red Hat Decision Manager 7.2.0 Add-Ons**

3. Extract the downloaded **rhdm-7.2.0-add-ons.zip** file to a temporary directory.

4. In the WebLogic Administration Console, navigate to **Security Realms → Users and Groups**.

5. In the **kie-server** group that you created previously, create a user for the headless Decision Manager controller, such as **controller**, and a password for this new user and click **OK**. For more information about creating groups and users, see Section 4.1, "Configuring the Decision Server group and users".

6. Navigate to **Deployments** to view all existing applications.

7. Click **Install**.

8. Navigate to the temporary directory where you downloaded and extracted the **rhdm-7.2.0-add-ons.zip** file, and go to **rhdm-7.2.0-add-ons/rhdm-7.2-controller-ee7.zip/controller.war**.

9. Select the **controller.war** file and click **Next** to continue.

10. Select **Install this deployment as an application** as the targeting style and click **Next**.

11. Keep the application name as **controller** and set the security model to **DD Only**. Leave the remaining options as default and click **Next** to continue.

12. In the **Additional Configuration** section, choose **No, I will review the configuration later** and click **Finish**.

6.1. SETTING SYSTEM PROPERTIES FOR THE HEADLESS DECISION MANAGER CONTROLLER

After you install the headless Decision Manager controller, set the system properties listed in this section on your application server or servers to enable proper interaction with the headless Decision Manager controller.

> **NOTE**
>
> For optimal results, install Decision Server and the headless Decision Manager controller on different servers in production environments. In development environments, you can install Decision Server and the headless Decision Manager controller on the same server. In either case, be sure to make these property changes on all application servers where the headless Decision Manager controller is installed.

Prerequisite

Decision Server and the headless Decision Manager controller are installed on the application server instance.

Procedure

1. Specify the following JVM property values on the application server instance where the headless Decision Manager controller is installed:

   Table 6.1. Required properties for the headless Decision Manager controller

Name	Requirement
org.kie.server.user	A user with the **kie-server** role
org.kie.server.pwd	The password for the user specified in the **org.kie.server.user** property

2. Specify the following JVM property values on the application server instance where Decision Server is installed:

   Table 6.2. Required properties for Decision Server when headless Decision Manager controller is installed

Name	Requirement
org.kie.server.controller.user	A user with the **kie-server** role
org.kie.server.controller.pwd	The password for the user specified for the **org.kie.server.controller.user** property
org.kie.server.id	The ID or name of the Decision Server installation, such as **rhdm700-decision-server-1**

Name	Requirement
org.kie.server.location	The URL of the Decision Server, **http://<HOST>:<PORT>/kie-server/services/rest/server**
org.kie.server.controller	The URL of the headless Decision Manager controller, **http://<HOST>:<PORT>/controller/rest/controller**

<HOST> is the ID or name of the Decision Server host, for example, **localhost** or **192.7.8.9**.

<PORT> is the port of the Decision Server host, for example, **7001**.

6.2. VERIFYING THE INSTALLATION

After you install the headless Decision Manager controller and define the required system properties and role requirements on the application server, verify that the headless Decision Manager controller works correctly.

Prerequisites

- Decision Server and the headless Decision Manager controller are installed on the application server instance.

- You have set all required system properties and role requirements for the headless Decision Manager controller on the application server.

Procedure

In your command terminal, enter the following command to verify that the headless Decision Manager controller is working:

```
curl -X GET "http://<HOST>:<PORT>/controller/rest/controller/management/servers" -H "accept: application/xml" -u '<CONTROLLER>:<CONTROLLER_PWD>'
```

<HOST> is the ID or name of the Decision Server host, for example, **localhost** or **192.7.8.9**.

<PORT> is the port of the Decision Server host, for example, **7001**.

<CONTROLLER> and **<CONTROLLER_PWD>** are the user credentials that you created in this section.

The command should return information about the Decision Server instance.

> **NOTE**
>
> Alternatively, you can use the Decision Server Java API Client to access the headless Decision Manager controller.

If the headless Decision Manager controller is not running, stop and restart the application server instance and try again to access the headless Decision Manager controller URL or API.

CHAPTER 7. NEXT STEPS

- *Getting started with decision services*

- *Designing a decision service using guided decision tables*

APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Tuesday, May 28, 2019.