Red Hat Decision Manager 7.0

Installing and configuring Decision Server on IBM WebSphere Application Server

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Abstract

In this guide, you will install and configure IBM WebSphere Application Server for use with Decision Server.

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PREFACE

This document describes how to configure IBM WebSphere Application Server (IBM WebSphere) for Decision Server and how to install Decision Server on IBM WebSphere.

CHAPTER 1. INTRODUCTION

1.1. RED HAT DECISION MANAGER

Red Hat Decision Manager is an open source decision management platform that combines business rules management and complex event processing. It includes decision management and business resource optimization capabilities. With Red Hat Decision Manager, you can automate business decisions and make that logic available to the entire business.

Red Hat Decision Manager uses a centralized repository for storing all resources. This ensures consistency, transparency, and the ability to audit across the business. Business users can modify business logic and business processes without requiring assistance from IT personnel.

Red Hat Decision Manager is made up of Decision Central, Decision Server, and Red Hat Business Optimizer.

- Decision Central is the graphical user interface where you create and manage business rules.
- Decision Server is the server where the rules and other artifacts are stored. Decision Server is used to instantiate and execute rules and solve planning problems.
- Red Hat Business Optimizer is a lightweight, embeddable planning engine that optimizes planning problems.

This guide explains how to install Decision Server on IBM WebSphere Application Server (IBM WebSphere).

For information about running the Decision Central standalone JAR file, see *Installing Red Hat Decision Manager on premise*. For information about installing Red Hat Business Optimizer, see *Installing and configuring Red Hat Business Optimizer*.

1.2. IBM WEBSPHERE APPLICATION SERVER

IBM WebSphere is a flexible and secure web application server that hosts Java-based web applications and provides Java EE-certified run time environments. IBM WebSphere 9.0 supports Java SE 8 and is fully compliant with Java EE 7 since version 8.5.5.6.

CHAPTER 2. INSTALLING IBM WEBSPHERE

You must download and install IBM Installation Manager before installing IBM WebSphere.

2.1. DOWNLOADING AND INSTALLING IBM INSTALLATION MANAGER

1. Download IBM Installation Manager version 1.8.5 or later from the IBM Installation Manager and Packaging Utility download links page.
2. Extract the downloaded archive and run the following command as the root user in the new directory:

```
sudo ./install
```

IBM Installation Manager opens.

3. Go to **File** → **Preferences** and click **Add Repository**.
The **Add Repository** dialog window opens.
4. Enter the repository URL for IBM WebSphere 9.0. You can find all the repository URLs in the Online product repositories for WebSphere Application Server offerings page of the *IBM Knowledge Center*. For example:

```
http://www.ibm.com/software/repositorymanager/V9WASILAN
```

2.2. CREATING A WEBSPHERE PROFILE AND USER NAME

A profile defines the run time environment. The profile includes all the files that the server processes in the run time environment and that you can change. The user is required for login. In this example, we will use **`websphere`** for both the user name and password.

1. From your terminal, navigate to the WebSphere Application Server folder location that you specified during the installation.
2. Change to the **`/bin`** directory and run the following command:

```
sudo ./manageprofiles.sh -create -profileName testprofile -
adminUserName websphere -adminPassword websphere
```

2.3. STARTING THE SERVER

1. From your terminal, navigate to the WebSphere Application Server folder location that you specified during installation.
2. Change to the **`/profiles/testprofile/bin`** directory and run the following command:

```
sudo ./startServer.sh server1
```

3. Navigate to **`http://`*`TARGET_SERVER`*`:9060/ibm/console`** in your web browser and log in with the user credentials created in the previous procedure. For example: **`http://localhost:9060/ibm/console`**.
The **WebSphere Integrated Solutions Console** opens.

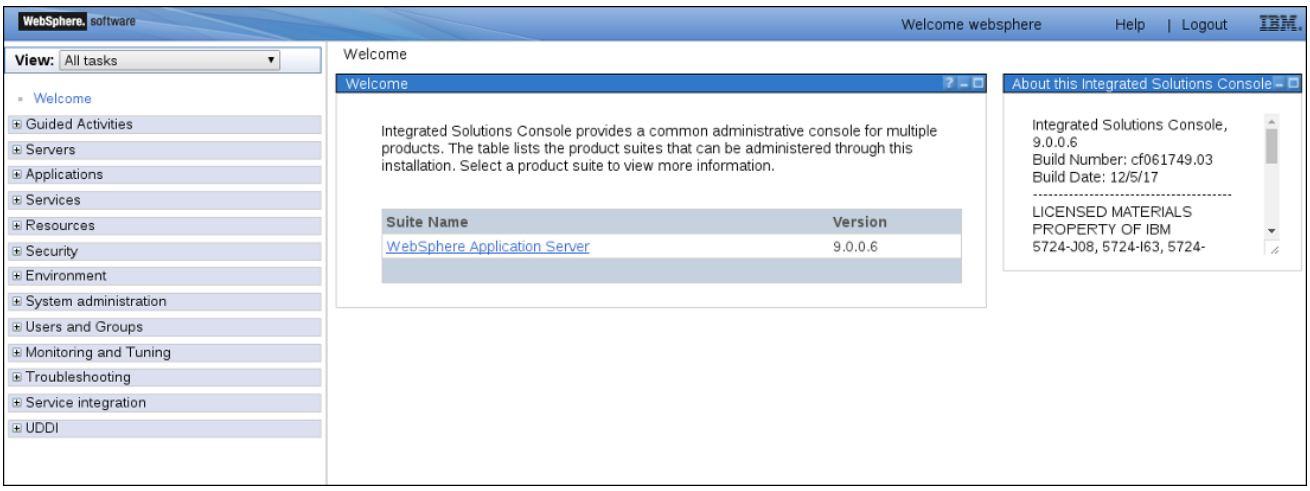
CHAPTER 3. CONFIGURING IBM WEBSPHERE FOR DECISION SERVER

Before you can deploy Decision Server on IBM WebSphere, you must configure the server to accept the deployable `kie-server.war` file.

Prerequisites

You have successfully logged in to the IBM WebSphere's **IBM Integrated Solutions Console**. The main menu on the left side of the console contains all the links necessary for configuring the application server.

Figure 3.1. IBM Integrated Solutions Console

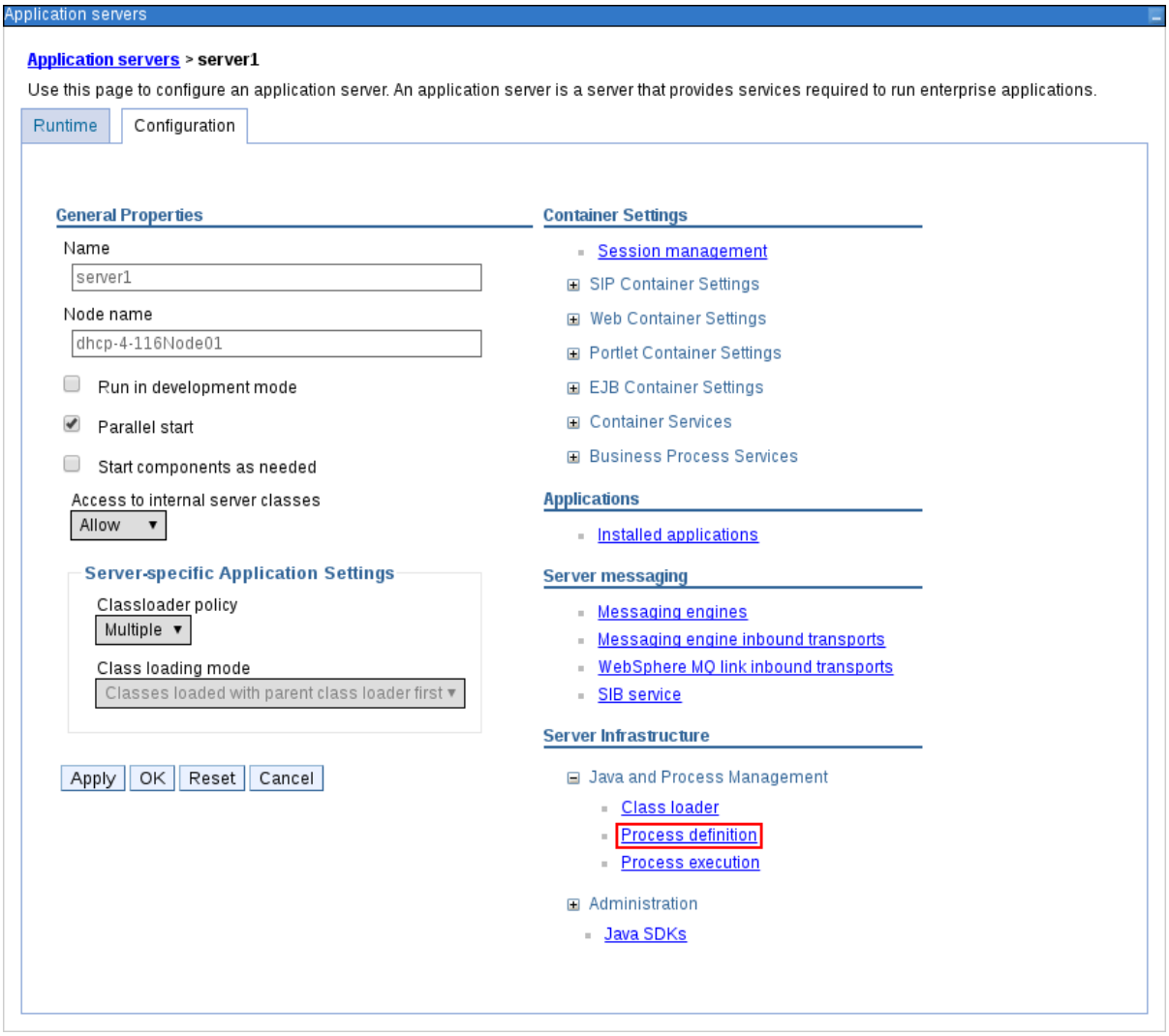


3.1. INCREASING JVM HEAP SIZE

The default JVM heap size in IBM WebSphere may cause errors when deploying Decision Server. To avoid issues, increase the heap size:

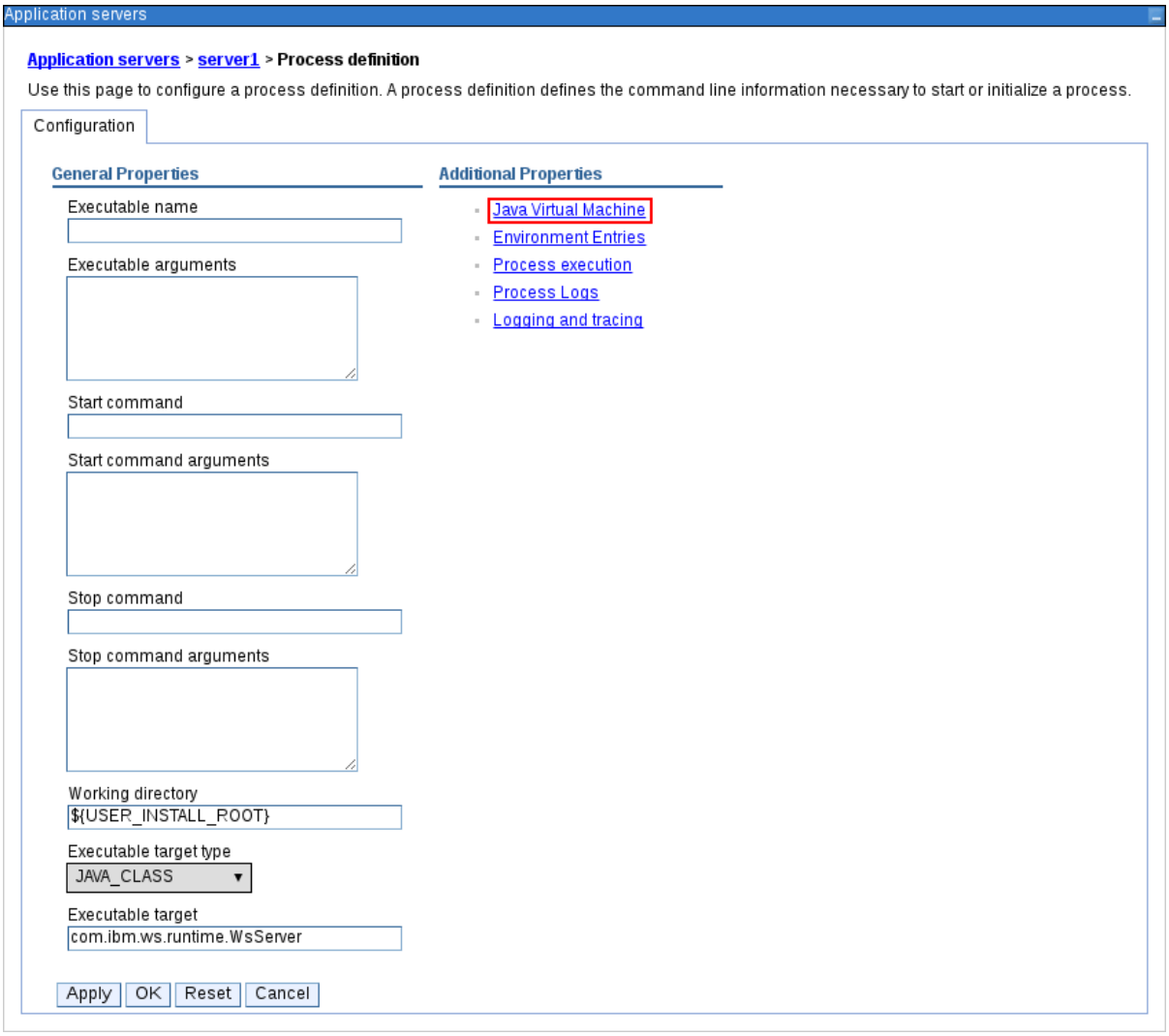
1. In the **Integrated Solutions Console**, go to **Servers → Server Types → WebSphere application servers**.
2. From the list of application servers, click on the server that you are going to deploy Decision Server. For example, `server1`.
   The configuration page for `server1` opens.
3. Under **Server Infrastructure**, expand **Java and Process Management** and click **Process definition**.

Figure 3.2. Application server configuration page



4. Click **Java Virtual Machine** under **Additional Properties**.

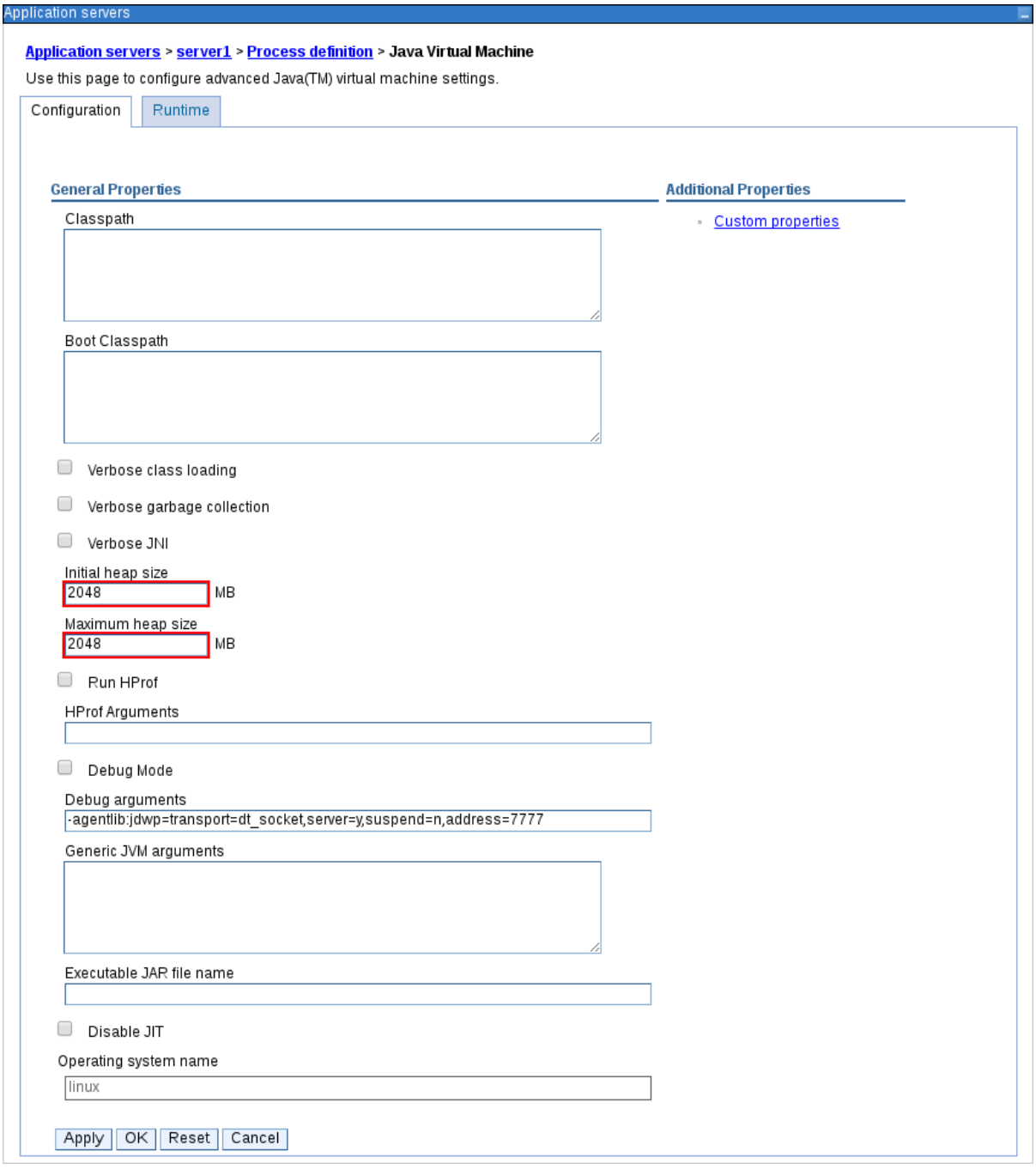
Figure 3.3. Process definition configuration page



The **General Properties** for the JVM that is used to start the server page opens.

5. Change both the **Initial heap size** and **Maximum heap size** to **`2048`**. Decision Server has been tested with this value.

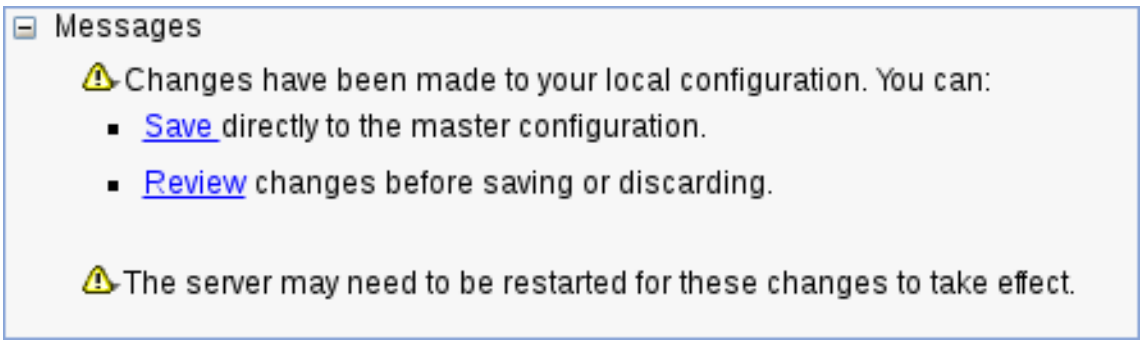
Figure 3.4. JVM configuration page



6. Click **Apply**.

7. Click **Save** in the **Messages** window to save your changes to the master configuration.

Figure 3.5. Messages pop-up



8. Stop and restart the server in your terminal by navigating to the WebSphere Application Server **/bin** directory location that you specified during installation.

9. Run the following commands:

```
sudo ./stopServer.sh server1
```

```
sudo ./startServer.sh server1
```

3.2. ENABLING SECURITY

Enable administrative security so that you have the required permissions to create users and groups.

1. In the main menu, click **Security** → **Global Security**. Ensure that the option **Enable Application Security** is checked. This may already be checked and overridden at the server level.

2. Click **Security Configuration Wizard** and click **Next**.

3. Select the repository that contains the user information. For example, select **Federated repositories** for local configurations.

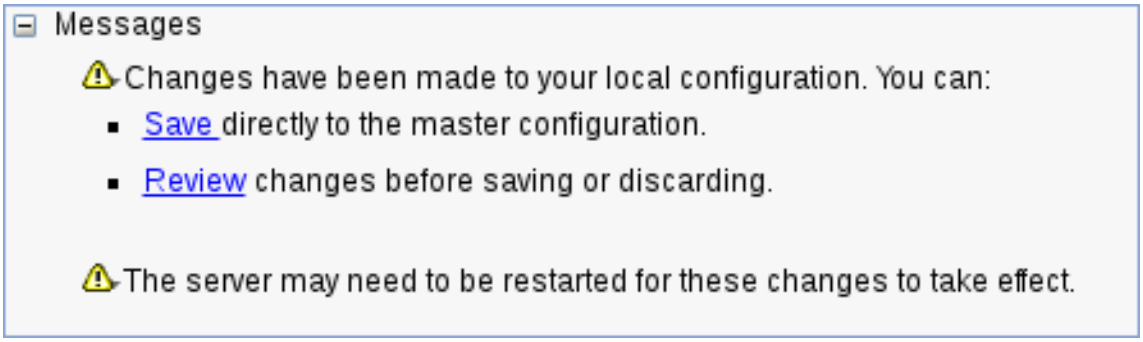
4. Click **Next**

5. Input the **Primary administrative user name** and **Password**.

6. Click **Next** then **Finish**.

7. Click **Save** in the **Messages** window to save your changes to the master configuration.

Figure 3.6. Messages pop-up



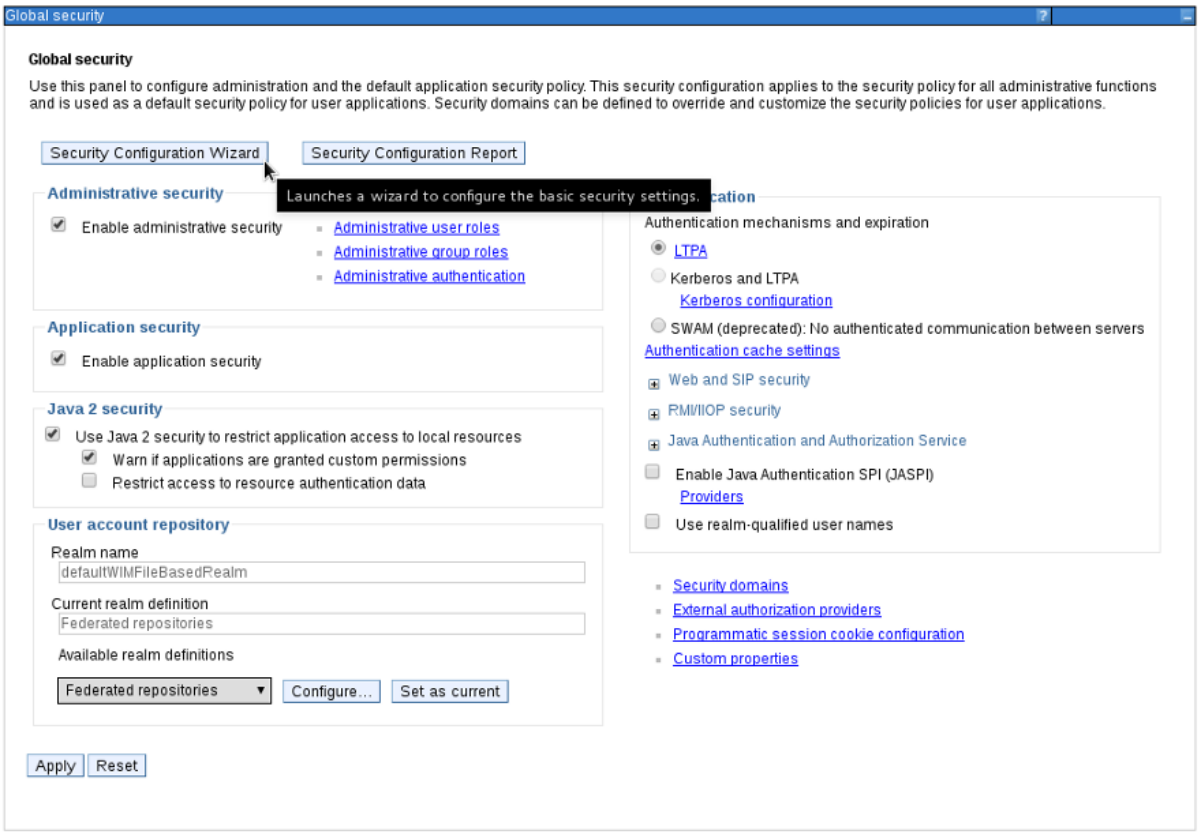
8. Stop and restart the server in your terminal by navigating to the WebSphere Application Server **/bin** directory location that you specified during installation.

9. Run the following commands:

```
sudo ./stopServer.sh server1
```

```
sudo ./startServer.sh server1
```

Figure 3.7. Global Security Configuration Page



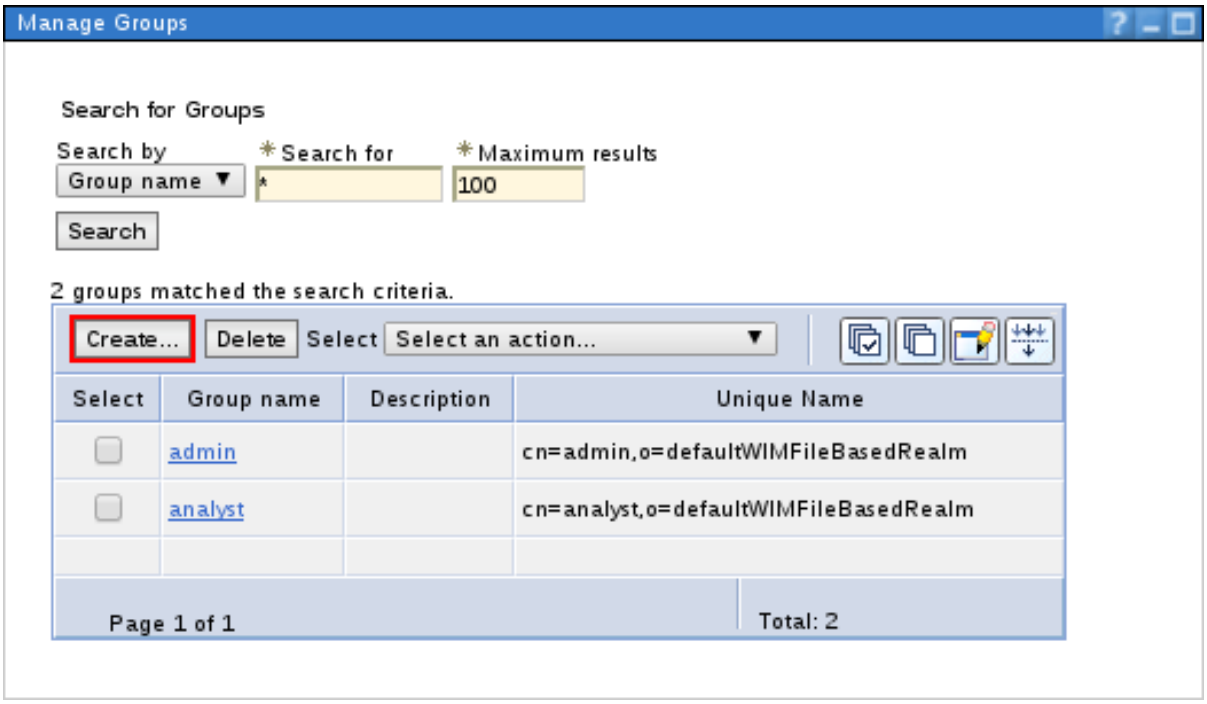
3.3. CREATING USERS AND GROUPS

1. Paste **`http://TARGET_SERVER:9060/ibm/console`** in to your web browser and log in with the user credentials created in the previous procedure. For example: **`http://localhost:9060/ibm/console`**.
   The **WebSphere Integrated Solutions Console** opens.

2. Click **Users and Groups** → **Manage Groups**.

3. Create the **`kie-server`** group by clicking **Create**.

Figure 3.8. Created groups



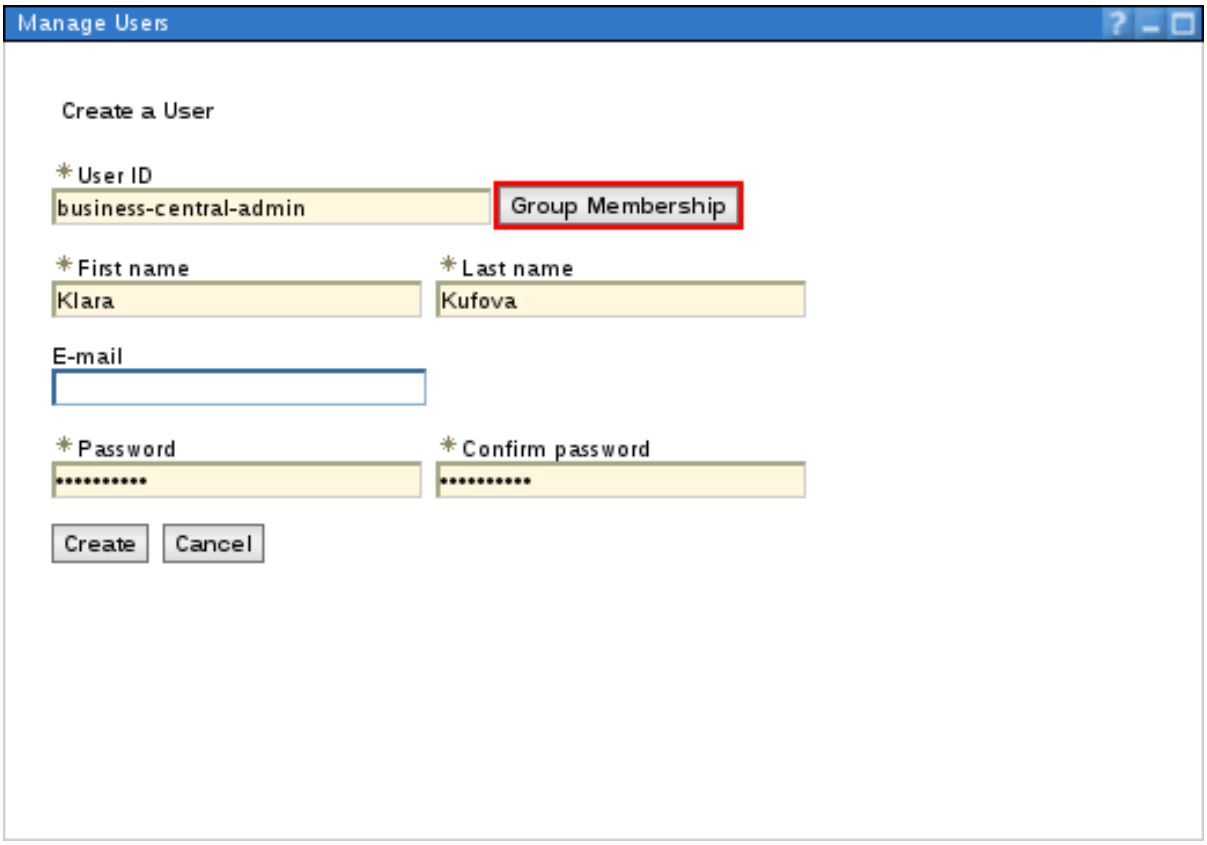
4. Click **Users and Groups** → **Manage Users**.
5. Click **Create** and fill in the user credentials.

IMPORTANT

Make sure that the selected **User ID** does *not* conflict with any known title of a role or a group.

For example, if there is a role called **`kie-server`**, you should *not* create a user with the user name **`kie-server`**.

Figure 3.9. Create User Dialog Window



6. Click **Group Membership**.
7. Assign the user to the `kie-server` group and click **Create**.

3.4. SETTING UP JMS RESOURCES

Create a service bus in IBM WebSphere to send and receive JMS messages through the Decision Server if one does not already exist.

3.4.1. Creating the service bus

1. Click **Service Integration** → **Buses** → **New**.
2. Enter a new bus name and deselect the **Bus Security** option.
3. Click **Next** and then **Finish** to create the service bus.

3.4.1.1. Adding a bus member

Add a new bus member, which is a server or a cluster that is added to the service bus.

1. Click **Service Integration** → **Buses** and click on the service bus that you have created.
2. Click **Bus Members** in the **Topology** section, and click **Add**.
3. In the **Add a New Bus Member** wizard, choose the server and the type of message store for persistence. You can also specify the properties of the message store.
4. Click **Finish** to add the new bus member.

3.4.2. Creating JMS connection factories

To send and receive messages from Decision Server, you must create the JMS connection factories. Connection factories are required for establishing connections when sending messages into queues.

Create the **`KIE.SERVER.REQUEST`** and **`KIE.SERVER.RESPONSE`** connection factories.

NOTE

The factory names shown above are suggestions only and you can change them to suit your needs and company guidelines.

1. Click **Resources** → **JMS** → **Connection Factories**.
2. Select the correct scope and click **New**.
3. Select the **Default Messaging Provider** option and click **OK**.
4. Enter the name and the JNDI name of the factory. For example:
   - **Name**: **`KIE.SERVER.REQUEST`**
   - **JNDI name**: **`jms/conn/KIE.SERVER.REQUEST`**

NOTE

The JNDI name for **`KIE.SERVER.RESPONSE`** is **`jms/conn/KIE.SERVER.RESPONSE`**.

5. Select the service bus from the **Bus Name** drop-down list.
   Leave the default values for the remaining options.
6. Click **Apply** and **Save** to save the changes to the master configuration.

3.4.3. Creating JMS queues

JMS queues are the destination end points for point-to-point messaging.

Create the **`KIE.SERVER.REQUEST`** (for requests) and **`KIE.SERVER.RESPONSE`** (for responses) queues.

1. Click **Resources** → **JMS** → **Queues**.
2. Select the correct scope and click **New**.
3. Select the **Default Messaging Provider** option and click **OK**.
4. Enter the name and the JNDI name of the queue, for example:
   - **Name**: **`KIE.SERVER.REQUEST`**
   - **JNDI name**: **`jms/KIE.SERVER.REQUEST`**

NOTE

All of the JNDI names follow the same convention as the example above.

5. From the **Bus Name** drop-down list, select the service bus created earlier.
6. From the **Queue Name** drop-down list, select the **Create Service Integration Bus Destination**. The **Create New Queue** form opens to assist you with creating a new service integration bus.
7. Enter a unique identifier and select the bus member that you created earlier.
8. Click **Apply** and **Save** to save the changes to the master configuration.

3.4.4. Creating JMS activation specifications

A JMS activation specification is required and is the bridge between the queue and the message-driven bean.

For Decision Server, create the **`KIE.SERVER.REQUEST`** (for requests) and **`KIE.SERVER.RESPONSE`** (for responses) activation specifications.

1. Click **Resources** → **JMS** → **Activation Specifications**.
2. Select the correct scope and click **New**.
3. Select the **Default Messaging Provider** option and click **OK**.
4. Enter the name and the JNDI name of the activation specification, for example:
   - **Name**: **`KIE.SERVER.REQUEST`**
   - **JNDI name**: **`jms/activation/KIE.SERVER.REQUEST`**

NOTE

All of the JNDI names of other activation specifications follow the same convention as the example above.

5. From the **Destination Type** drop-down list, select **Queue**.
6. Enter the **Destination lookup** (as created in the previous procedure), for example **`jms/KIE.SERVER.REQUEST`**.
7. Select the service bus from the **Bus Name** drop-down list.
   Leave the default values for the remaining options.
8. Click **Apply** and **Save** to save the changes to the master configuration.

You have successfully completed the JMS configuration required for setting up Decision Server on IBM WebSphere.

3.4.5. Adding custom Java Virtual Machine (JVM) properties

You must add custom properties to the JVM that is used to start IBM WebSphere.

1. Click **Servers** → **Server Types** → **WebSphere Application Servers**.
2. In the list of application servers, choose the server on which you are going to deploy Decision Server.
3. Under the **Server Infrastructure**, click **Java and Process Management** → **Process Definition**.
4. Click **Java Virtual Machine** in the **Additional Properties** section.
   This opens the configuration properties for the JVM that is used to start IBM WebSphere.
5. Click **Custom Properties** under **Additional Properties**.
6. Create the following properties by clicking **New** → **Custom JVM Properties**.

Table 3.1. Required properties for Decision Server

Name	Value	Description
`org.jboss.logging.provider`	`jdk`	This property is only required where a **`CA SiteMinder TAI (SMTAI)`** is installed in the environment. Using this property forces Hibernate to use **`JDK`** instead of **`log4j`** for logging within Dashbuilder. **`CA SiteMinder TAI (SMTAI)`** contains an old version of **`log4j`**, which causes conflicts.
`org.apache.wink.jaxbcontextcache`	`off`	This property ensures that the IBM WebSphere Apache Wink framework does not cache **`JAXBContexts`**, which negatively impacts the performance and interferes with the custom-type serialization for the REST API.
`kie.server.jms.queues.response`	`jms/conn/KIE.SERVER.RESPONSE`	The JNDI name of connection factory for responses used by the Decision Server.
`org.kie.server.domain`	`WSLogin`	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.
`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.

7. Click **Save** to save the changes to the master configuration.

8. Restart IBM WebSphere for these changes to take effect.

CHAPTER 4. DOWNLOADING AND EXTRACTING DECISION SERVER

You must download and extract Decision Server prior to installing it on IBM WebSphere.

4.1. DOWNLOADING DECISION SERVER

Download the deployable Decision Server package file for IBM WebSphere from the Red Hat Customer Portal.

1. Log in to the Red Hat Customer Portal.
2. Click **DOWNLOADS** at the top of the page.
3. On the **Product Downloads** page that opens, navigate to the **JBOSS INTEGRATION AND AUTOMATION** section, and click **Red Hat Decision Manager**.
4. On the **Software Downloads** page, if necessary select **Decision Manager** from the **Product** menuand **7.0** from the **Version** menu.
5. Download the following product distributions:
   - **Red Hat Decision Manager Decision Server for All Supported EE7 Containers** (`rhdm-7.0.0.GA-kie-server-ee7.zip`)
   - **Red Hat Decision Manager 7.0.0 Add Ons** (`rhdm-7.0.0.GA-add-ons.zip`)
6. Extract these files to a temporary directory. For example, `TEMP_DIR`.

4.2. EXTRACTING DECISION SERVER

The downloaded installation ZIP file for Decision Server (`rhdm-7.0.0.GA-kie-server-ee7.zip`) contains the Red Hat Decision Manager WAR deployable archive (`kie-server.war`).

From the terminal, extract the downloaded ZIP file to gain access the deployable WAR files:

```
unzip rhdm-7.0.0.GA-kie-server-ee7.zip -d TEMP_DIR
```

Navigate to the `TEMP_DIR` > `kie-server.war` folder and run the following command:

```
zip -r kie-server.war ./*
```

CHAPTER 5. INSTALLING DECISION SERVER

Now that the basic configuration is complete and IBM WebSphere is ready to deploy Red Hat Decision Manager, you can upload the deployable WAR file that was extracted earlier. The Red Hat Decision Manager ZIP file for IBM WebSphere contains the deployable WAR file for Decision Server.

1. Click **Applications** → **Application Types** → **WebSphere Enterprise Applications**.
   This shows you all of the existing applications in the system and enables you to install a new one.
2. Click **Install**.
3. Upload the Decision Server WAR file (`kie-server.war`) from the local file system.
4. Select **Fast Path** and click **Next**.
   The **Install New Application** wizard opens.
5. Change the **Application Name** to `kie-server` and click **Next**.
6. Map the Decision Server modules to servers according to your specific requirements and click **Next**.
7. In the **Bind Listeners for Message-Driven Beans**, select **Activation Specification** for both beans and enter `jms/activation/KIE.SERVER.REQUEST` in the **Target Resource JNDI Name** field.
8. Enter the `jms/conn/KIE.SERVER.REQUEST` JNDI name for the `KIE.SERVER.REQUEST` connection factory.
9. In the **Map Virtual Hosts for Web Modules** section, keep the default values and click **Next**.
10. Set the context root to `kie-server`.
11. In the **Metadata for Modules** section, keep the default values and click **Next**.
12. Click **Finish** to install the Decision Server.
13. Click **Save** to save the changes to the master configuration.

5.1. MAPPING GROUPS TO ROLES

Map the `kie-server` role to a user or a group.

1. Go back to the main configuration page for the newly installed `kie-server` application (**Applications** → **Application Types** → **WebSphere Enterprise Applications**).
2. Click **Security Role to User/Group Mapping** under **Detail Properties**.
3. Select the `kie-server` role and click **Map Groups** to search for the `kie-server` group.
4. Move the `kie-server` group from the **Available** list to the **Selected** list and click **OK**.

This mapping gives the previously created administrator user access to the Decision Server. . Click **Save** and start the `kie-server` application.

Check whether the Decision Server REST API works by sending a GET request at **http://*TARGET_SERVER:PORT*/kie-server/services/rest/server**.

CHAPTER 6. INSTALLING AND RUNNING THE STANDALONE DECISION SERVER CONTROLLER

You can configure Decision Server to run in managed or unmanaged mode. If Decision Server is unmanaged, you must manually create and maintain containers. If Decision Server is managed, the standalone Decision Server Controller manages the Decision Server configuration and you interact with the Controller to create and maintain containers.

The standalone Decision Server Controller is integrated with Decision Central. If you install Decision Central, use the **Exection Server** page to create and maintain containers. However, if you do not install Decision Central, you can install the standalone Decision Server Controller and use the REST API or the Decision Server Java Client API to interact with it.

6.1. DOWNLOADING AND EXTRACTING THE CONTROLLER

You must download and extract the standalone Decision Server Controller before installing it on IBM WebSphere.

1. Log in to the Red Hat Customer Portal.
2. Click **DOWNLOADS** at the top of the page.
3. On the **Product Downloads** page that opens, navigate to the **JBOSS INTEGRATION AND AUTOMATION** section, and click **Red Hat Decision Manager**.
4. On the **Software Downloads** page, if necessary select **Decision Manager** from the **Product** menu and **7.0** from the **Version** menu.
5. Click **Download** next to **Red Hat Decision Manager 7.0.0 Add Ons**.
6. Unzip the **`rhdm-7.0.0.GA-add-ons.zip`** file. The **`rhdm-7.0-controller-ee7.zip`** file is in the unzipped directory.
7. Extract the **`rhdm-7.0-controller-ee7.zip`** file to a temporary directory, for example, **`TEMP_DIR`**.
8. Navigate to the **`TEMP_DIR/controller.war`** folder and run the following command:

```
zip -r controller.war ./*
```

6.2. SETTING ENVIRONMENT VARIABLES FOR THE CONTROLLER

Set the environment variables listed in this section.

Prerequisites

- Decision Server installed on an IBM WebSphere instance
- The Controller installed on an IBM WebSphere instance

NOTE

Red Hat recommends that you install Decision Server and the standalone Decision Server Controller on different servers in production environments. However, if you install Decision Server and the standalone Decision Server Controller on the same server, for example in a development environment, make these changes on the same IBM WebSphere instance.

- On Decision Server nodes, a user with the **`kie-server`** role
- On the Controller server nodes, a user with the **`kie-server`** role

Procedure

1. Specify the following JVM property values on the IBM WebSphere instance where the Controller is installed:
   - **`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 IBM WebSphere instance where Decision Server is installed:
   - **`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, for example, **`rhdm700-decision-server-1`**
   - **`org.kie.server.location`**: **`http://<HOST>:<PORT>/kie-server/services/rest/server`**
   - **`org.kie.server.controller`**: The URL of the standalone Decision Server Controller, for example **`http://<HOST>:<PORT>/controller/rest/controller`**
     In the preceding examples:
   - **`<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, **`8080`**.

6.3. INSTALLING THE CONTROLLER

This section describes how to install the Controller on IBM WebSphere Application Server.

You can install the Controller and use the REST API or the Decision Server Java Client API to interact with it.

Prerequisites

- An IBM WebSphere instance configured as described in this document

- Sufficient user permissions to complete the installation
- The **`rhdm-7.0-controller-ee7.zip`** file, extracted and repacked to the **`controller.war`** file

Procedure

1. Click **Applications** → **Application Types** → **WebSphere Enterprise Applications**.
   This shows you all of the existing applications in the system and enables you to install a new one.
2. Click **Install**.
3. Upload the Controller WAR file (**`controller.war`**) from the local file system.
4. Select **Fast Path** and click **Next**.
   The **Install New Application** wizard opens.
5. In the **Map Virtual Hosts for Web Modules** section, keep the default values and click **Next**.
6. Set the context root to **`controller`**.
7. In the **Metadata for Modules** section, keep the default values and click **Next**.
8. Click **Finish** to install the controller.
9. Click **Save** to save the changes to the master configuration.

6.3.1. Mapping Groups to Roles

Map the **`controller`** role to a user or a group.

Procedure

1. Go back to the main configuration page for the newly installed **`kie-server`** application (**Applications** → **Application Types** → **WebSphere Enterprise Applications**).
2. Click **Security Role to User/Group Mapping** under **Detail Properties**.
3. Select the **`kie-server`** role and click **Map Groups** to search for the **`kie-server`** group.
4. Move the **`controller`** group from the **Available** list to the **Selected** list and click **OK**. This mapping gives the previously created administrator user access to the Decision Server.
5. Click **Save** and start the **`kie-server`** application.

6.3.2. Verifying the installation

After you install and start the controller, verify that it works correct.

Procedure

1. To verify that the Controller is working on IBM WebSphere, enter the following command:

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

In this command, replace **<CONTROLLER>** and **<CONTROLLER_PWD>** with the user credentials that you created in this section.

The output of this command provides information about the Decision Server instance.

2. Check whether the Controller REST API works by sending a GET request at **http://*TARGET_SERVER:PORT*/kie-server/services/rest/server**.

APPENDIX A. VERSIONING INFORMATION

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